DOCUMENT RESUME

ED 196 459 JC 800 586

TITLE Audio-Visual Study.
INSTITUTION San Diego Community Coll. District, Calif. Research Office.
PUB DATE 2 Jun 80
NOTE 109p.

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS *Audiovisual Aids: Audiovisual Centers: *Centralization: Community Colleges: *Cost Effectiveness: Costs: Equipment Maintenance: *Equipment Utilization: *Facility Inventory: *Purchasing: Standards: Two Year Colleges: Use Studies
IDENTIFIERS San Diego Community Colleges CA

ABSTRACT

Based on a three-part study conducted by the San Diego Community College District (SDCCD), this report presents recommendations for the cost-effective utilization of audio-visual (AV) equipment. The report first details the study's methodology, which involved a survey of the AV management practices at 10 California community colleges, an examination of AV policies at SDCCD, and interviews with district AV personnel. After a discussion of ways the study could have been revised, the report outlines steps to be taken for improving AV management: (1) pooling, coding, and maintaining inventories of all AV items at a centralized location: (2) developing a centralized AV check-out system: (3) developing a cost-avoidance system which, through monthly usage reports, compares actual usage with potential usage for each AV item: (4) using this information in determining standards for optimum allocation of the AV budget: and (5) establishing a district-wide committee to coordinate AV policies and control purchases. Finally, the report discusses miscellaneous concerns, including the use of historical data to track purchase and maintenance costs over time, the desirability of a centralized repair center and the time involved in implementing the recommendations. Findings for each of the study components are appended. (JP)

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SAN DIEGO COMMUNITY

COLLEGE DISTRICT

AUDIO-VISUAL STUDY

U.S. DEPARTMENT OF HEALTH
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Research & Planning

CE 800 596

ANALYSIS OF

THE SDCCD AUDIO-VISUAL SYSTEM

CONDUCTED FOR:

FACILITIES/EQUIPMENT

This report is based upon information received from numerous District sources. The accuracy/validity of the information provided within this report is solely the responsibility of each site/source from which it was received. Any unauthorized additions or corrections not approved by Research & Planning invalidates the findings of this report.

Prepared by:

Research/Planning

June 2, 1980

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ABSTRACT

The high costs of AV purchases and maintenance, coupled with a lack of a systematized, Districtwide AV purchasing, allocation, and service delivery system, have resulted in problems exemplified mainly by high parts inventories, high repair costs, inventories exceeding true demand, and interdepartmental and intersite conflict.

The methodology to study these problems utilized surveys and interviews.

Based on the study's findings, recommendations for actions to be taken were mainly in the areas of:

1. Pooling and centralizing AV items at sites for improved physical and informational control;
2. The development and implementation of a cost-avoidance system for determining AV allocation;
3. The establishment of a Districtwide AV committee;
4. The establishment of a Districtwide Repair/Maintenance Center;
5. Implementation of new delivery systems;
6. Implementation of a new purchasing system.

SECTION ONE

INTRODUCTION TO THE PROBLEM AREA

SECTION ONE

INTRODUCTION TO THE PROBLEM AREA

Two major factors and their corollary problems prompted the need for analysis of and recommendations regarding the District's audio-visual (AV) system:

1. Of approximately $11 million in total equipment inventory, roughly $1,023,000 (9.30%) is identified as AV equipment (according to records of Facilities/Equipment).
2. Lack of systematized coordination across the District's sites in the way of:
   a. Delivery systems;
   b. Allocation systems;
   c. Purchasing systems;
   d. Maintenance systems.

Prior to, and during the course of the study, it was found that lack of systematized coordination has resulted in ongoing problems of:

1. Sites being unable to share equipment with other sites;
2. Departments refusing to share equipment with other departments;
3. Inability of most sites AV centers to control for purchases made by that site's departments, leading to duplication of AV purchases and departments purchasing items more expensive than need be;
4. Inventories of each site exceeding total site demand;
5. Inability to conduct accurate inventories of AV items at most sites;
6. Lack of each AV center having physical and informational control over AV items at most sites;
7. No existing policy-making body; e.g. a Districtwide AV committee composed of AV personnel from each site;
8. Large annual capital losses for stolen or misplaced equipment;
9. Inability of AV centers to have direct and immediate access to all AV items (viz., department "owned" items) leading to lack of a total preventative maintenance program which results in maintenance costs being higher than need be.

As a result of the high costs of purchasing and maintaining AV items, the Director of Facilities/Equipment requested Research/Planning to conduct an analysis of the District's AV system and to make recommendations accordingly.

The scope of the study focused on:

1. Defining "AV", not only for operationalizing AV terms/items during the study, but also for purposes of developing reporting systems which would concern themselves with the defined terms;
2. Identifying the types, numbers, and locations of existing AV items (within our defined categories);
3. The surveying of other colleges, universities, and schools as to the working of their AV systems;
4. Recommending an improved delivery/check-out system;
5. Recommending an improved allocation system;
6. Recommending a new purchasing system;
7. Analyzing costs/benefits, advantages/disadvantages of newly developed systems;
8. Examining the effects of new systems on maintenance;
9. Estimating the time required to develop the new systems and the best time to implement;
10. Developing "standards", meaning:
    a. Movement toward the standardization of equipment across all District sites to reduce the high parts inventory and to decrease repair order costs;
    b. Movement toward the development of usage standards for each defined AV category for each site; e.g., 12 - 16mm projectors/ 1000 students;
11. Establishing a Districtwide AV committee;
12. Recommending new AV inventory procedures and reporting format;
13. Service delivery for off-campus instructors;
14. Addressing Adult Education's AV system;
15. AV items purchased with grant monies;
16. Charge-backs to departments for damages.

SECTION TWO

METHODOLOGY

SECTION TWO

METHODOLOGY

As the concerns of the AV study involved more of an operational problem vis a vis a programming (management) or development (planning) problem, the means of data collection were clear cut. This involved:

1. The surveying of other colleges, universities, and schools in Southern and Central California as to:
   a. AV storage (viz., centralized or decentralized per campus);
   b. Approximate annual labor costs;
   c. Approximate sunk costs in AV equipment;
   d. Approximate inventory of AV items;
   e. The most frequently used AV items;
   f. The number of staff required;
   g. The delivery/check-out system;
   h. Charge-backs to departments for AV breakage;
   i. The maintenance system;
   j. The student population;
   k. The ratio of AV dollars/students;
   l. The ratio of AV person hours/students;
   m. The AV center's square footage.

   The survey was conducted to gain a basic understanding of how other districts assume their AV systems and to provide a general framework for further inquiries into our own AV system. The results of the survey should not serve as cross-jurisdictional standards for our own AV system (viz., number of AV items in a given category per 1000 students, etc.). It would be an improper "leap of inference" to assume that because school X's AV system has certain characteristics that we like, our AV system should have, or should make, movement toward similar characteristics. Such an inference assumes that the school whose AV system's characteristics are desirable to emulate has an efficient and effective system in the first place. In short,

the other AV system may appear "better", but ultimately it may be in more difficult straits than our AV system.

2. The surveying of our District's sites as to their AV center's:
   a. Square footage;
   b. Location on campus;
   c. Purchasing system;
   d. Delivery/Check-out system;
   e. Maintenance system;
   f. Physical/informational control system (inventory);
   g. Staffing.

3. Interviewing key personnel of each site, including Adult Headquarters, who are directly involved in their site's AV system (e.g, Media Technicians, AV Librarians, Inventory Technicians).

SECTION THREE

FINDINGS

FINDINGS

The findings are divided into three areas:

1. Findings based on surveys of other colleges, universities, and schools (see Section Six, Appendix, Part One);
2. Findings based on survey of the District's AV system (see Section Six, Appendix, Part Two);
3. Findings based on interviews with the District's key AV personnel. These findings are several of the stated problems listed in Section One - namely, Problem Numbers: 1, 3, 5, 6, 7 and 9.

(Problem Numbers 1-9 are specifically addressed throughout the balance of the study, including Section Six, Appendix, Part Two.)

It should be noted at this point that the methodology utilized (and therefore, the subsequent findings) was not as extensive as desired by Research/Planning. The crux of the problem which precluded a more extensive analysis was that of the sites' inventories ("Equipment Inventory Location Listings", Run-Date of 5/1/79) being highly inaccurate. These inaccuracies were learned during the course of the study (resulting in a complete revamping of methodology and potential subsequent recommendations). Furthermore, it was learned that if an inventory was conducted again as an attempt to properly update the listings, the inventory would still remain inaccurate. Fault does not lie with the District's warehouse; rather, it lies in the fact that departments actually have, and do, hide AV equipment. Also, some sites have "borrowed" AV equipment from other sites and then have recoded the equipment with such labels as "Property of Site _____", which also prevents an accurate inventory.

The method that might have been used in conducting a major portion of the study (assuming accurate inventories) is:

STEP ONE: "Audio-Visual" would have been defined as all AV items which:

1. Are mobile (not permanently attached to a building/structure);

STEP ONE: (continued)

2. May or may not be functional/operable;

3. May or may not be salvageable;

4. Are used in a classroom setting or any other learning situation;

5. Are used by staff, faculty, and students.

The following AV hardware and software would have been the focus of the study (note that the following defined AV items were nonetheless used in the actual study. Henceforth, the term "AV" denotes only these items):

DEFINED AV ITEMS

	HARDWARE	SOFTWARE
1.	16mm Projector	16mm Film
2.	8mm Projector, Sound	8mm Film, Sound
3.	8mm Projector, Silent	8mm Film, Silent
4.	Opaque Projector	District-owned Transparencies
5.	Slide Projector (Track & Carousel)	District-owned slides
6.	Filmstrip Projector, Silent	District-owned Filmstrips, Silent
7.	Filmstrip Projector, Sound (via Cassette & Record)	District-owned Sound Filmstrips and all Corresponding Cassettes & Records
8.	Overhead Projectors	(See "Opaque")
9.	Tape Recorder, Reel-to-Reel (Records & Plays Back by Itself)	Reel-to-Reel Tapes, District-owned)
10.	Tape Player, Reel-to-Reel (Can only Play Back or Record When Used with an Amp/Receiver)	(See "Tape Recorder")
11.	Cassette Recorder, (Records & Plays Back by Itself)	District-owned Cassettes
12.	Cassette, Playback (Can Only Play Back or Record When Used with an Amp or Receiver)	District-owned Cassettes
13.	Video Playback/Recorder, Reel-to-Reel	District-owned Video Tapes
14.	Video Playback/Recorder, Cassette	District-owned Cassettes
15.	Record Players, Mono, Manual	District-owned Records
16.	Record Players, Stereo, Manual	District-owned Records
17.	Record Changer, Turntable	District-owned Records
18.	Turntable, Manual	District-owned Records

DEFINED AV ITEMS

HARDWARE	SOFTWARE
19. T.V. Camera, Porta Pak	(See Video Tapes)
20. T.V. Receiver, Audio	N/A
21. Projection Screen, Unattached	N/A
22. Portable P.A. System	N/A

(The above items exclude any Learning Labs; e.g., Language Labs with permanent equipment, and the T.V. Production Center.)

STEP TWO: Those items not meeting the AV definition would have been eliminated from each site's inventory.

STEP THREE: Each site's remaining inventory would then have been totaled for each category of items as defined above.

STEP FOUR: Instructors in each department at each site would then have been surveyed as to:

1. Number of estimated usage hours for each defined item, last semester/current semester (hardware);
2. Expected number of usage hours for each defined item, next semester.

STEP FIVE: From the survey, the following information would have been compiled for each site:

1. Past usage hours per defined category;
2. Future usage hours per defined category (as directly given by instructors);
3. Calculated probable future usage hours per defined category derived from:
   a. Weighted probabilities, future hours probable use; or,
   b. Moving averages, future hours probable use.

STEP SIX: Via a survey of AV repair technicians, coupled with a review of maintenance records, the following would have been derived:

1. Probable total "downtime" due to maintenance per defined category. This, in turn, allows for calculation of:

STEP SIX: (continued)

2. Potential use (measured in hours) per defined category;

3. Variance between potential usage versus probable usage.

STEP SEVEN: Data from Steps Four - Six would have given us the following:

(EXAMPLE) -

TABLE I - ALLOCATION MODEL

MESA COLLEGE

Item	# On Hand Presently	Dept.	Probable Usage Next Semester	Potential Usage Next Semester	Variance
16mm Projectors	Inventory of 10	Eng. Psych. Soc. Sc. P.E. Math History	109.56 294.54 227.19 52.08 28.74 186.78	10 - 16mm at 200 hrs. each per Semester = 2000 hrs. (Accounting for downtime)	1101.11 Unused Hours.
Total	10		898.89 hrs.	2000 hrs.	1101.11 hrs.

Conclusion:

1. 898.89/200 = 4.5 (5) 16mm projectors needed;

2. Therefore, 5 - 16mm's are removed from site and stored.

The removed items can also be substituted for future needs of this site or others.

Assumptions:

1. The AV items are centrally located in the AV center or are stored in satellite lockers;

2. All AV items have a high probability of not being simultaneously needed (viz., 5 - 16mm's, all 6 departments wanting to show a film at the same time);

3. Precise scheduling is utilized via "First Come/Reserved, First Served" basis.

SECTION FOUR

RECOMMENDATIONS OF ACTIONS TO BE TAKEN

RECOMMENDATIONS OF ACTIONS TO BE TAKEN

RECOMMENDATION ONE - Problem Numbers Focus: 1, 2, 3, 4, 5, 6 and 9.

ACTIONS TO BE TAKEN: Pooling, coding and inventorying of items.

STEP ONE: All defined items at each site will be physically pooled (defined as per Section Three).

STEP TWO: All the pooled items, including those of the AV Center, are categorized into:

1. Operable Condition - No need for repair;
2. Inoperable Condition - Economically repairable (meaning the cost of the repair itself would not exceed the cost of replacing the item);
3. Inoperable Condition - Uneconomically repairable (meaning the cost of repair exceeds replacement cost of the item, but the item is salvageable for spare parts);
4. Inoperable Condition - Unsalvageable.

STEP THREE:

Assumption: Current inventories are inaccurate; therefore, all pooled items in all categories will be recoded as far as possible per recommended inventory format (see Recommendation Six regarding suggested new format for AV inventory).

STEP FOUR:

1. Operable condition items will remain at the site, centrally located in the AV Center (temporary or permanently, depending on which delivery/check-out system is opted for - see Recommendation Two);
2. Inoperable Condition - Economically repairable items will either be:
   a. Retained at the site's AV Center if it is opted that there will not be a Districtwide, centralized Repair/Maintenance Center (viz., perhaps at the warehouse for repair of AV items - see Section Five, Point 2);

STEP FOUR: (continued)

2. (continued)

   b. Forwarded to a Districtwide Repair/Maintenance Center for repair, then returned to the site's AV Center (see Section Five, Point 2);

3. Inoperable Condition - Uneconomically repairable items will be catalogued and forwarded to the District's warehouse for storage. The items' salvageable parts will be used in the future as spare parts;

4. Inoperable Condition - Unsalvageable items will be (possibilities):

   a. Auctioned off as is (although not economically feasible for us to repair/salvage, these items may possibly be in demand by AV dealers/businesses);

   b. Donated (e.g, DAV, AM VETS, Goodwill, etc.);

   c. Simply junked;

   d. Saved for instructional purposes for electronics students.

RECOMMENDATION TWO - Problem Numbers Focus: 1, 2, 3, 5, 6, 8 and 9.

ACTIONS TO BE TAKEN: Development of new delivery/check-out system.

Alternative One: AV items centrally located at site's AV Center.

Assumption A: Criteria for Alternatives - Those distribution/check-out systems that allow for:

1. All defined AV items to be under physical control of each site's AV Center;

2. All defined AV items to be under each AV Center's reporting/information control (viz., check-out/service delivery information system and cost-avoidance reporting system);

3. The site's instructors to have equal access to AV items on a first-come, first-served basis;

4. Easy, convenient access for instructors;

5. Accurate and convenient inventory of AV items;

6. Easy location control for access to AV items for maintenance.

RECOMMENDATION TWO (continued)

Assumption B: All AV items are under one inventory controlled by AV Center.

Assumption C: All AV purchase/replacement requests must be approved by a Districtwide AV Committee comprised of AV personnel from all pertinent sites.

Assumption D: Adequate staffing is available to deliver, set up, and return AV items (e.g., Work-Studies).

Procedures: Alternative One, Delivery/Check-Out System

STEP ONE: Instructor submits request for AV item or phones in request.

STEP TWO: At this time, the AV Center schedules delivery and pick-up times per request and collects information regarding:

1. Type of AV item - hardware and Code #;
2. Type of AV item - software, Code # and title;
3. Room number of showing;
4. Return date (maximum - 3 days);
5. Instructor's name and department.

STEP THREE: Work-Study delivers hardware and software and sets up. Work-Study returns to AV Center for other deliveries/tasks. Prior to actual delivery, check-out/request slip is time punched out and noted as "Real Time".

STEP FOUR: Work-Study picks up and returns AV item to AV Center. Check-out/request slip is time punched in and noted as "Real Time".

STEP FIVE: Work-Study inspects hardware and software for damage and notes each item's condition as "Okay", "Not Okay", and logs in return of AV items.

Alternative Two: Majority of AV items centrally located in AV Center with the most frequently used AV items to be stored in strategically located satellite lockers/closets.

Assumptions:

1. As per Assumption "A", Alternative One
2. As per Assumption "B", Alternative One
3. As Per Assumption "C", Alternative One
4. Adequate staffing to provide delivery/pick-up of AV items is unavailable (viz., inability to schedule Work-Studies as required, or lack of Work-Studies).

STEP ONE: Instructor submits request for AV item or phones in request.

STEP TWO: At this time, the AV Center collects information regarding:

1. Type of AV item - hardware, and code # (depending on which satellite locker instructor will need access to);
2. Type of AV item - software, code # and title:
3. Room number of showing
4. Return date (maximum - 3 days - date applies to return of item to locker and return of locker key to AV Center);
5. Instructor's name and department;
6. Locker number;
7. Key number issued to instructor.

STEP THREE: Instructor picks up:

1. Key from AV Center;
2. Map showing locker number and its location (if needed).

STEP FOUR: When AV Center issues key to instructor, a check-out slip is time punched out and noted as "Real Time".

STEP FIVE: Instructor returns hardware to locker, returns software and key to AV Center, and informs AV Center of any Hardware damage.

STEP SIX: AV Center reviews software for damage. Check-out slip is time punched in and noted as "Real Time". AV Center logs in return of key and software.

The above alternatives should be addressed in detail by the AV Committee. Other concerns the committee should review are given in detail in Recommendation Five.

The advantages of Alternative One, Delivery/Check-Out System are:

1. Complete physical control of AV items;
2. Complete informational control and ease in conducting AV inventories;
3. Increase in security of AV items resulting in decreased damage/replacement costs;
4. Convenient access to AV items for preventative and routine maintenance;
5. Avoidance of duplication of purchases in that the AV Center has total and accurate inventory knowledge;
6. Avoidance of in-house conflict between departments wanting access to and use of the same piece of equipment;
7. Convenient delivery service for instructors.

The disadvantages of Alternative One, Delivery/Check-Out System are:

1. Work-Study students and/or hourlys may have to be hired to make deliveries and pick-ups;
2. The AV items have to be wheeled/carted to and from the usage location, some of which are distant from the AV Center (it should be noted, however, that the Facilities/Equipment Department's Architectural services has stated that all sites have interconnecting pathways linking each site's structures);
3. The AV Center would have to restructure their present storage system and may have to expand their square footage requirements;
4. The problems of departments adjusting to a new system (in the short run).

The advantages of Alternative Two, Delivery/Check-Out System, are equivalent to those of Alternative One, excluding Advantage #7, where, obviously, Alternative Two is less convenient for instructors. Additional advantages are:

1. Work-Study students or hourlys would not have to be hired;
2. AV items only have to be wheeled/carted a short distance (viz., from the satellite locker to a room, both of which are in the same building).

The disadvantages of Alternative Two, Delivery/Check-Out System are:

1. The AV Center would have to restructure their present storage system and may have to expand square footage requirements (not, however, to the extent as required in Alternative One);
2. There is less physical control over hardware items stored in satellite lockers/closets;
3. The problems of departments adjusting to a new system (in the short run).

At this point in time it is impossible to determine tangible costs and tangible benefits of either alternative to a new delivery/check-out system. Therefore, in spite of knowing that, ultimately, the District's concern regarding its AV system is to minimize costs, given an effectiveness constraint, alternatives cannot be compared as to cost-effectiveness.

It should be clear, however, that any additional costs incurred by the District would surely be offset by implementation of the recommended actions within the study.

RECOMMENDATION THREE - Problem Numbers Focus: 3 and 4.

ACTIONS TO BE TAKEN: Development and implementation of a cost-avoidance system as a means for determining:

1. Usage standards (e.g., 10 cassette recorders/500 students, required for a given site);
2. Potential usage hours vis a vis actual usage hours of a given AV category;
3. Repair/maintenance costs (including the number of items repaired, the $\bar{X}$ repair cost per item, and the $\bar{X}$ downtime per item) for a given AV category;
4. A given AV categories' potential usage hours as a percentage of all AV categories' potential usage hours;
5. A given AV categories' actual usage hours as a percentage of all AV categories' actual hours;

RECOMMENDATION THREE (continued)

6. The AV Center's labor and maintenance costs;
7. Cost per hour, potential usage, of a given AV category;
8. Cost per hour, actual usage, of a given AV category;
9. Cost variance between cost per hour, potential usage, and cost per hour, actual usage, of a given AV category.

How the cost-avoidance reporting system works and what it tells you:

Assumptions:

1. Reports are generated by site and Districtwide;
2. Reports represent data for single months;
3. Reports represent cumulative monthly data;
4. Reports represent each defined AV item as a separate category, each with its own data as per 1, 2 and 3 above.

Column Number:

1. The top column tells you that the data of its parallel columns are for the month of April 1980 only. The bottom column tells you that the data of its parallel columns are cumulative data for the months of January, February, March and April 1980, inclusive.
2. "AV Item" tells you what item of the defined AV items is listed.
3. "# On Hand" tells you how many 16mm projectors the site has (determined after items are physically pooled, coded and inventoried).
4. "Potential Usage Hours" tells you how many hours of service that 10 - 16mm projectors could theoretically have offered that site, <u>on an average</u>, for the month of April 1980 only. The average is determined by:

$$\left(\frac{\text{\# of Potential Svs. Hrs One AV Item in Given AV Category}}{\text{\# of Months in School Year}}\right) \left(\text{\# of AV Items On Inventory Within Given AV Category}\right) \left(\text{\# of Weeks in School Year}\right)$$

This figure is a constant for all months in the reporting period (both the individual month's data and cumulative months' data).

In the Mesa College Example (Figure I):

- 1 - 16mm has potential for an estimated service of 5 hours per school week (accounting for probable downtime due to maintenance) <u>whether the item is used or not</u>.
- Mesa has 10 - 16mm projectors.
- Mesa has 36 weeks in its school year (fall and spring semesters - optional reporting period could include summer school).
- Mesa has about 10 months in its school year:

$$\frac{(5/1)\ (10)\ (36)}{10} = \frac{1800 \text{ hrs.}}{10 \text{ mos.}} = 180 \text{ potential hours per each month}$$

Thus, for each and every month of the reporting period, there will be approximately 180 service hours that 10 - 16mm projectors can theoretically offer Mesa.

FIGURE I - EXAMPLE

MESA COLLEGE - REPORT FOR APRIL 1980

PART A

1	2	3	4	5	6	7	8	9	10	11
DATA FOR APRIL 80	AV ITEM	# ON HAND	POTENTIAL USAGE HOURS	ACTUAL USAGE HOURS	RATIO	VARIANCE HOURS	REPAIR/ MAINT. COSTS	# ITEMS REPAIRED	$\bar{X}$ REPAIR COST/ITEM	$\bar{X}$ DOWN TIME PER ITEM
	16mm Projectors	10	180 (This will be a constant)	100	.56	80	$43.00	2	$21.50	1.2 Hours
DATA FOR JAN-APRIL 80	AV ITEM	# ON HAND	POTENTIAL USAGE HOURS	ACTUAL USAGE HOURS	RATIO	VARIANCE HOURS	REPAIR/ MAINT. COSTS	# ITEMS REPAIRED	$\bar{X}$ REPAIR COST/ITEM	$\bar{X}$ DOWN TIME PER ITEM
	16mm Projectors	10	720 (this arithmetically increases each month by the amount of the constant, that constant being 180 hrs/mos, thus (4) (180) = 720)	380	.53	340	$481.00	4	$20.25	1.6 Hours

Column Number:

4. (continued)

Cumulative potential hours is determined by:

(# of Average Potential Usage Hrs/Month) (# of Months of Reporting)

Thus:

(180) (4 Months [Jan, Feb, March, April])

= 720 cumulative potential hours for the four-month period.

Thus: From Jan - April 1980, inclusive, there were 720 service hours that 10 - 16mm projectors could have offered Mesa.

5. "Actual Usage Hrs." tells you how many hours that 10 - 16mm projectors were actually utilized as a whole (not each 16mm).

This information is derived from the check-out/in slips showing "Real Time" when they are time punched "out" and "in". (Not mentioned before: When AV items are being serviced/repaired, they are to be time punched "downtime", "out" and "in".) Cumulative "Actual Usage Hrs." is determined by adding the monthly "Actual Usage Hrs." for all months reported (viz., Jan's, Feb's, March's and April's - assumed: Jan. 140 hrs., Feb. 20 hrs., March 120 hrs. and April 100 hrs., all totaling to 380 hrs.).

6. "Ratio" tells you the proportion of potential hours for the month that you actually used in service. In the Mesa example, of 180 potentially available service hours, 100 hours were actually used (100/180 = .56).

Cumulative "Ratio" tells you the proportion of potential hours for all months reported that were actually used (380/720 = .53).

For example, if at the end of the school year, only 598 hours of the available 1800 potential hours were used in "actual", or "Real Time" service, we would assume that Mesa had too many 16mm projector hours going unused.

7. "Variance Hours" tells you the net difference between "potential hours" and "actual hours" for the month. Thus, for Mesa, during April, 10 - 16mm projectors, as a whole, had 80 hours of unused service time.

Column Number:

7. (continued)

Cumulative "variance hours" tells you the same as above, except cumulatively for the months of Jan, Feb, March and April, inclusive. Thus, theoretically, from Jan. - April, 340 hours that should have been used were not used.

8. "Repair/Maintenance Costs" tells you the total costs in the way of repairs for all 10 - 16mm projectors for the month of April.

Cumulative "repair/maintenance costs" tells you the total cumulative costs for all months reported (Jan, Feb, March and April).

9. "# Items Repaired" tells you exactly how many 16mm projectors were repaired during the month of April.

Cumulative "# items repaired" tells you exactly how many 16mm projectors were repaired for all months - Jan, Feb, March and April.

10. "$\bar{X}$ Repair Cost/Item" tells you the arithmetic average of the cost of repairing one 16mm projector during April.

Cumulative "$\bar{X}$ Repair Cost/Item" tells you the arithmetic average of the cost of repairing one 16mm projector for all the months of Jan, Feb, March and April.

Thus, "$\bar{X}$ Repair Cost/Item" for April =

Repair/Maintenance Cost, April / # Items Repaired, April =

$43.00/2 = $21.50

11. "$\bar{X}$ Downtime/Item" tells you the arithmetic average time one 16mm projector was inoperable due to repairs/maintenance.

It is calculated by:

$$\frac{\text{Total "Downtime" } (\overline{\text{measured via time punch when down for maintenance}}) \text{ during April}}{\text{\# items repaired}}$$

$$= \frac{\text{2.4 hrs. "downtime" (assumed)}}{\text{2 items repaired}}$$

= 1.2 hours

Column Number:

11. (continued)

Cumulative "$\bar{X}$ Downtime/Item" tells you the arithmetic average time one 16mm projector was inoperable due to repairs/maintenance for all months of Jan, Feb, March and April. Thus:

$$\frac{\text{Total "downtime" during Jan + Feb + March + April}}{\text{\# items repaired in Jan + Feb + March + April}}$$

= 6.4 hrs. "downtime" (assumed)/4 items repaired

= 1.6 hours

Assumptions:

1. As per Report Part A, Assumption 1-4;
2. Costs do not include sunk costs of AV items.

Column Number:

1. Designates data as monthly or cumulative;
2. Designates AV item for the month and for cumulative months' data;
3. "As a % of all AV Potential Hours", for the month, tells you that 180 hours (see Figure III, Cost-Avoidance Work Sheet) represents 10.10% of all AV items' potential hours for each and every month (assuming a 10-month year). As 180 hours is a constant for each month, so will 10.10% remain a constant for each and every month.

   It is calculated by:

   For the month (see Figure III, Cost-Avoidance Work Sheet 180/1786 = 10.10% (or 1800/17860), giving a monthly constant of 10.10%.

   For the period of any month to any month: (see Figure III, Cost-Avoidance Work Sheet). In our case, Jan - April = 4 months; (4) (180)/(4) (1786) = 10.10%. Thus, a month-by-month constant of 10.10%. (This calculation is unnecessary as what is a percentage constant for one month will be the percentage constant for any cumulative series of months.)
4. "As a % of all AV Actual Hours" tells you:

   For the month - (see Work Sheet, Figure III) - that of all AV items' actual hours in service during the month, 16mm's represent 8.42% of these hours.

   It is calculated by:

   100/1188 = 8.42%

   Cumulative - that of all AV items' actual hours for the months of Jan - April, 16mm's represent 7.82% of these hours.

   It is calculated by:

   380/4861 = 7.82%

FIGURE II - EXAMPLE

MESA COLLEGE - REPORT FOR APRIL 1980

PART B

1	2	3	4	5			6	7	8
DATA	AV ITEM	AS A % OF ALL AV POTENTIAL HOURS	AS A % OF ALL AV ACTUAL HOURS	DEPARTMENT COSTS			COST PER HOUR POTENTIAL USAGE	COST PER HOUR ACTUAL USAGE	COST VARIANCE
				LABOR	MAINT.	TOTAL			
FOR APRIL 80	16mm Projectors	10.10	8.42	$17,000	$43	$17,043	$9.56	$14.35	$4.79
DATA FOR JAN-APRIL 80	16mm Projectors	10.10	7.82	$68,000	$81	$68,081	$9.55	$14.01	$4.46

FIGURE III - EXAMPLE

COST-AVOIDANCE WORK SHEET

MESA COLLEGE

AV ITEM	POTENTIAL HOURS YEAR	POTENTIAL HRS. EACH MONTHS	AS A % OF ALL AV POTENTIAL HOURS	ACTUAL HOURS J	F	M	A	TOTAL	(J-A) AS A % OF ALL ACTUAL HOURS	CUMULATIVE LABOR/ MAINT. COSTS, JAN-APR	LABOR/ MAINT. COSTS, APRIL ONLY
16mm	1800	180	10.10	140	20	120	100	380	7.82		
8mm Sound	100	10	.56	5	4	7	8	24			
8mm Silent	50	5	.28	5	5	4	4	18			
Opaque	1800	180	10.10	70	80	100	75	325			
Slide Projector	700	70	3.92	60	30	25	20	135			
Filmstrip Projector, Silent	350	35	1.96	15	-0-	20	35	70			
Filmstrip Projector, Sound	450	45	2.52	40	40	30	20	130			
Overhead Projector	980	98	5.49	90	85	80	75	330			
Tape Recorder, R/R	1000	100	5.60	90	90	85	80	345			
Tape Player, R/R	500	50	2.80	50	40	40	35	165			
Casette Recorder	1500	150	8.40	150	150	120	120	540			
Cassette Playback	1750	175	9.80	90	80	70	65	305			
Video Play/Rec.	2000	200	11.20	190	180	150	150	670			
Video Cassette	2000	200	11.20	190	70	50	200	510			
Record Player, Mono, Manual	50	5	.28	5	5	2	1	13			
Record Player, Stereo, Manual	75	7.5	.42	7	7	8	7	29			
Record Changer, Turntable	65	6.5	.36	5	5	5	5	20			
Turntable, Manual	50	5	.28	4	3	1	2	10			
T.V. Camera, Portable	90	9	.50	7	8	6	5	26			
T.V. Receiver, Audio	1500	150	8.40	120	130	100	90	440			
T.V. Receiver, Non-Audio	50	5	.28	5	3	7	1	16			
Projection Screen	700	70	3.92	70	70	65	70	275			
Portable P.A. System	300	30	1.68	30	20	15	20	85			
TOTAL	17860	1786		1438	1125	1110	1188	4861			

Each Divided by 4861

$68,081

$17,043

Column Number:

5. "Department Costs" tells you:

For the month - labor costs, repair/maintenance costs, and total costs, April only.

Cumulative - as above, Jan - April.

6. "Cost Per Hr. Potential Usage" tells you:

For the month - that during April, had the 16mm's been used to their fullest capacity, it would have cost Mesa College $9.56 for each hour the 16mm's were in use.

It is calculated by:

(Total dept. costs for the month) (Column 3) / (Potential usage hrs. for the month) (From Figure I)

= ($17,043) (.1010)/180 hours = $9.56/hr.

Cumulative - That through the period of Jan - April, had the 16mm's been used to their fullest capacity, it would have cost Mesa College $9.55 for each hour the 16mm's were in use.

It is calculated by:

(Cumulative total dept. costs) (Column 3) / (Cumulative potential usage hrs. (from Figure I)

($68,081) (.1010)/720 hrs. = $9.55/hr.

7. "Cost Per Hr. Actual Usage" tells you:

For the month - that during April, as a result of the actual hours of usage, it cost Mesa College $14.35 for each hour the 16mm's were used.

It is calculated by:

(Total dept. costs for the month) (Column 4, for the month) / (Actual usage hrs. for the month (from Figure I)

($17,043) (.842)/100 hrs. = $14.35/hr.

"Cost Per Hr. Actual Usage"

Cumulative - tells you that during the period Jan - April, the actual hours of usage cost Mesa College $14.01 for each hour of usage.

Column Number:

7. (continued)

It is calculated by:

(Cumulative total dept. costs) (Column 4, cumulat.) / (Cumulative actual usage hrs. (from Figure I))

($68,081) (.782)/380 hrs. = $14.01/hr.

8. "Cost Variance" is the net difference between "Cost Per Hour Potential Usage" and "Cost Per Hour Actual Usage", for both monthly and cumulative data.

For the month, it is calculated:

(Cost per hr. potential usage for the month) — (Cost per hr. actual usage for the month)

= ($9.56) - ($14.35) = (-)$4.79

(The sign is arbitrary)

For cumulative months, it is calculated:

(Cost per hr. potential usage cumulative months) — (Cost per hr. actual usage, cumulative months)

= ($9.55) - ($14.01) = (-)$4.46

(The sign is arbitrary)

Thus, as actual usage begins to approach or equal potential usage, AV items' usage efficiency increases (all other factors held constant; e.g., student population, rapid change in technology, rapid inflation).

RECOMMENDATION FOUR - Problem Numbers Focus: 3 and 4.

ACTIONS TO BE TAKEN: Development of usage standards to determine optimum allocation of AV items.

Assumptions:

1. An efficiency trend is decipherable after one, 10-month reporting period of data (viz., there has been continuity in reporting and months of data are not missing);
2. Data fed into the monthly reports are adjusted if new purchases have been made and the purchases add to the "# On Hand" rather than merely replacing items;

Assumptions: (continued)

3. Standards are developed and tailored for each site;

4. The methodology for developing standards is applied across all sites.

Methodology

A 10-month reporting period's data is examined as to the degree to which the final report's cumulative potential usage hours relate, in proportion, to cumulative actual usage hours.

Thus, if after 10 months Mesa, for example, shows cumulative potential usage hours (16mm's) significantly exceeding cumulative actual usage hours, you would know that there are too many hours of unused service time (measured as "Cumulative Variance Hours").

EXAMPLE ONE: Underutilization, 16mm's

Reporting Period, Jan - Oct, 80-81.

$\frac{\text{Cumulative Potential Usage Hours}}{\text{Cumulative Actual Usage Hours}}$ (Data is assumed for illustration)

= 1800/1020 = 1.76. If the ratio $>$ 1.00, then 16mm's are being underutilized (and you therefore assume that there are too many 16mm's).

Another way to state this is: If 1800 hours is optimum for 10 - 16mm's, let 1800 hours = 100%. Then,

1020/1800 = 56.67%

Thus, 16mm's are only being utilized to 56.67% of their capacity. If 10 - 16mm's are on hand, then:

(10) (.5667) = 5.667 (viz., 6) 16mm's are all that are theoretically required for Mesa. This would then be Mesa's standard for 16mm's.

Therefore, if Mesa's student population is, for example, 20,000, it can be assumed that only 6 - 16mm's are required (viz., .3 16mm's/1000 students).

(Note: The figure to be used for student population should be the average $[\overline{X}]$ of all semesters recorded during the 10-month reporting period.)

RECOMMENDATION FOUR (continued)

Methodology (continued)

EXAMPLE TWO: Balanced Utilization, 16mm's

Example One assumed that cumulative potential usage hours exceeded cumulative actual usage hours. If their ratio had been approximately 1.00 after the 10-month reporting period, then the standard would have been 10 - 16mm's/20,000 students, or .5 16mm's/1000 students.

EXAMPLE THREE: Overutilization, 16mm's

Let us assume cumulative potential usage hours after the 10-month reporting period were significantly less than cumulative actual usage hours:

Ratio: $\frac{\text{Cumulative Potential Usage Hours}}{\text{Cumulative Actual Usage Hours}}$

= 1800/2100 = .86, or

2100/1800 = 1.17%,

Thus, if Mesa has 10 - 16mm's, they are being overutilized by 17%, and would theoretically need:

(10 - 16mm's) (.117) = 1.17 (2) additional 16mm's.

With overutilization, maintenance costs and scheduling problems may increase accordingly. Remember, potential usage hours, when originally calculated, must be as accurate as possible and must account for downtime due to routine and preventative maintenance.

In this case, Mesa's 16mm standard would be 10 original 16mm's + 2 required 16mm's/20,000, or 12 16mm's/20,000 students (.6 16mm's/1000 students).

These three approaches should be applied to all defined AV items as each AV item will require standards.

It is not absolutely necessary to wait 10 months to see whether a given site can or cannot make purchases for additional equipment. The 10-month

EXAMPLE THREE: (continued)

period is advised in order to obtain a significant trend so that standards can be developed to serve as guidelines as to how many each of the AV items is required by each site.

Therefore (assuming the AV Committee is active), if a purchase request for, let us say, a new 16mm is reviewed by the AV Committee for Mesa, and assuming the reporting system has only been in operation for four months (e.g, Jan - April, as in our example), AND, the AV Committee sees that Mesa's cumulative potential usage hours are 720 hours, and the cumulative actual usage hours are 380 hours, the AV Committee would know that Mesa's 16mm's were not being put to optimum use and would reject the purchase request for an additional 16mm projector.

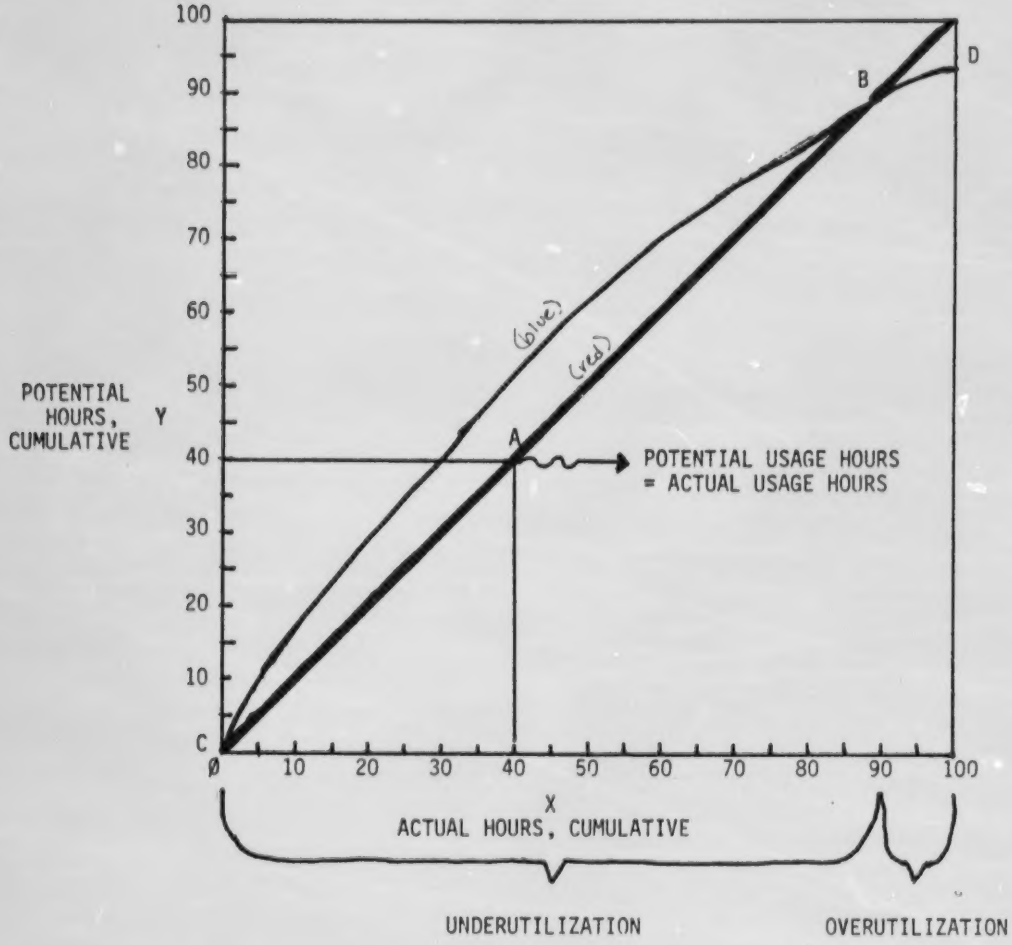
The concept of "balance" between cumulative potential usage hours and cumulative actual usage hours can be graphically illustrated.

Referring to Figure IV, Cumulative Potential Usage Hours (CPU), are plotted against cumulative actual usage hours (CAU) for cassette recorders. The diagonal red line represents perfect balance for all 100 hours between cumulative potential usage hours and cumulative actual usage hours. For example, at Point "A" on the red line, CPU = CAU. In our example, however, cassettes are not being fully utilized as represented by the blue line segment $\overline{CB}$. For example, when CPU = 50 hours, CAU = 40 hours. At Point "B", CPU = CAU, and a "balance" is reached. At Point "B", cassettes are being utilized at their optimum level of usage. Beyond Point "B" (blue line segment $\overline{BD}$), cassettes are theoretically being overutilized. For example, when CPU = 95 hours, CAU = 100 hours.

To establish the cost-avoidance reporting system, the AV Committee and each site will need the assistance of Stadium Plaza's Computing Services. The Research/Planning Office will also assist the committee and sites in developing the cost-avoidance reporting system if this recommendation is opted for.

FIGURE IV

CUMULATIVE POTENTIAL USAGE HOURS
AND CUMULATIVE ACTUAL USAGE HOURS



	CUM. POTENTIAL	CUM. ACTUAL
JAN.	10	5
FEB.	20	12
MAR.	30	19
APR.	40	30
MAY	50	40
JUNE	60	50
JULY	70	62
AUG.	80	72
SEP.	90	87
OCT.	95	100

ASSUME

1. CASSETTES, PLAYBACK RECORD
2. MONTHLY POTENTIAL USAGE HOURS = 10 HOURS
3. Y AXIS = POTENTIAL HOURS, CUMULATIVE
4. X AXIS = ACTUAL HOURS, CUMULATIVE

RECOMMENDATION FIVE - Problem Numbers Focus: 1, 2, 3, 4, 6 and 7.

ACTIONS TO BE TAKEN: Establishment of a Districtwide AV Committee to coordinate AV policy and to control for AV purchases.

A Districtwide AV Committee should be established to set policy regarding purchases and intercampus loans of AV items.

Assumptions:

1. The committee is composed of AV representatives as follows:

Campus	Representative
City	Jim Dark
Mesa	Karen Sharpe or Armondo Abina
Miramar	Carolyn Norman
ECC	Tom Badua
Adult (All sites)	Shirley Callard

2. The committee should meet once a month.
3. The committee shall possess administrative power to:
   a. Review new AV item purchase requests, Districtwide;
   b. Review replacement of AV item requests, Districtwide;
   c. Set up and review AV procedures, general and specific, Districtwide;
   d. Form design and form flow;
   e. Implement the cataloguing of films, cassettes, equipment, etc., either on a Districtwide or site basis.
4. The committee should be chaired by a representative elected by the committee. The chair should revolve every semester.
5. The committee should consider having a representative serving as liaison between the committee and the Purchasing Department of Business Services.
6. The committee should view itself as a learning-web for the exchange of information and ideas, such as state of the art technology which can move the District into a more cost-effective/efficient AV system.
7. The committee should serve as a "sounding board" for intercampus conflicts regarding loans of AV equipment and other problems.

Assumptions (continued)

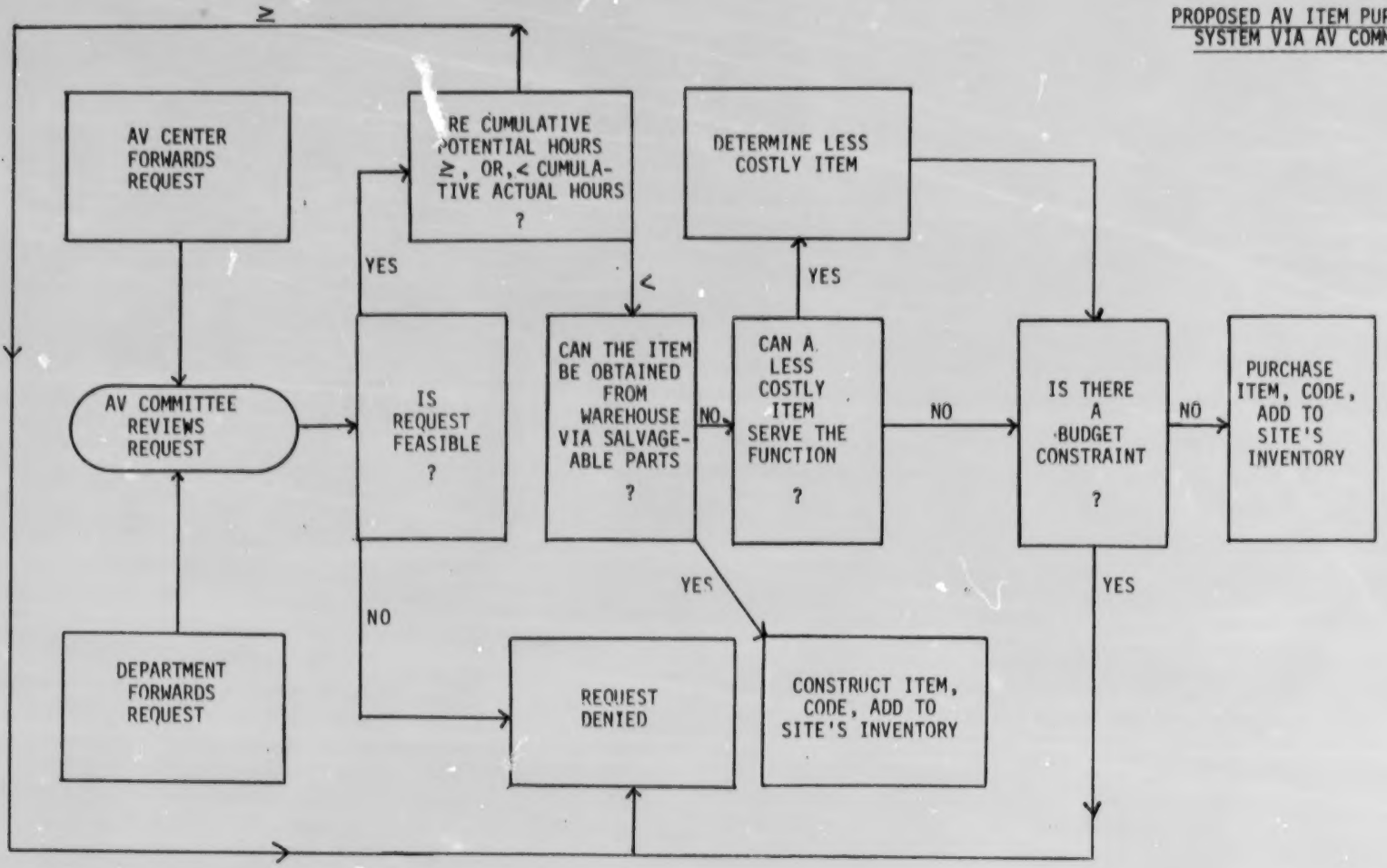
8. The committee should be directly involved in the development of a centralized Districtwide AV repair/maintenance facility (see Section Five, Point 2).
9. The committee will utilize the cost-avoidance reporting system as a partial means of verifying the validity of AV purchase requests.
10. The committee should work closely with media repair technicians to promote information/idea exchange.
11. The committee should be directly involved with the District's inventory technicians in the way of AV technical guidance when:
    a. The initial pooling of defined AV items occurs (for inventory, coding, categorization as to ability to function, and storage location);
    b. Regular inventories are conducted.
12. The committee's members should confer and determine AV form design and usage for Districtwide standardization. Examples include:
    a. Delivery/Check-Out/Check-In Forms;
    b. Request for Use Forms;
    c. Log-In/Log-Out Forms;
    d. Equipment Standards Forms (such as those currently used by City);
    e. Check-In/Check-Out Forms when AV items are down due to maintenance;
    f. Usage Standards Forms (viz., X amount of a particular AV item per 1000 students).
13. The committee, in regards to Point 12. d above, should make specific efforts to standardize equipment purchases to decrease the District's high parts inventory and repair costs as, in the past, purchases have come from a broad variety of manufacturers.

<u>AV Purchases</u>:

As noted, the AV Committee shall possess the administrative power to control for AV item purchases. The basic process is shown as a flow chart in Figure V

FIGURE V

PROPOSED AV ITEM PURCHASING SYSTEM VIA AV COMMITTEE



RECOMMENDATION FIVE (continued)

AV Purchases (continued)

The process is as follows:

1. A request is forwarded to the committee by either a committee member (viz., a given AV Center or a given department);
2. The committee reviews the request as to feasibility. If the request is not feasible, it is rejected;
3. If the request is feasible, the committee then verifies whether the AV item's category shows that cumulative potential hours equals or exceeds, or is less than cumulative actual hours. If the requested AV item's category shows CPU equal to our exceeding CAU, the request is denied. If, however, CPU is less than CAU, the request is considered further;
4. The committee then considers whether the item can be constructed/obtained from salvageable parts stored at the warehouse (including those categorized as salvageable during the initial pooling, coding, and inventorying of items). If it can be constructed/obtained, then it is coded and added to the site's inventory;
5. If an item cannot be constructed from salvageable parts, then the committee determines whether a less costly item can serve the function. If a less costly item will work equally well, the committee then determines if there is a budget constraint;
6. If a budget constraint does not exist, then the item is purchased, coded and added to the site's inventory (including incorporation into the cost-avoidance reporting system). If a budget constraint does exist, the request is denied (again, assuming that the item cannot be constructed from salvageable parts).

RECOMMENDATION SIX - Problem Numbers Focus: 5 and 6.

ACTIONS TO BE TAKEN: Redesign of current AV inventory format.

Beyond the fact that the AV inventories are inaccurate, their format is difficult to scan. The most problematic area is the "Cost-Description" column. Not having AV nor inventory expertise, Research/Planning recommends that the AV

RECOMMENDATION SIX (continued)

Committee develop a revised format. One suggestion, however, is that continuity in the "Cost Description" column should be maintained; e.g., perhaps a format of generic name (e.g., cassette recorder), followed by trade name (e.g., Sanyo), followed by model number (e.g., 2250).

In addition, separate inventories should be developed for:

1. AV items as defined in the study that are in operable condition, including those that were determined as inoperable condition, economically repairable, and have been repaired and incorporated into the inventory (by site and Districtwide);
2. AV items as defined in the study that are salvageable, but are not economically repairable (by District's warehouse);
3. AV items not defined in the study (viz., those items such as maps, globes, microscopes, etc.) (by site and Districtwide).

SECTION FIVE

MISCELLANEOUS CONCERNS

SECTION FIVE

MISCELLANEOUS CONCERNS

1. Demonstrating Cost-Avoidance - It was noted in Recommendation Two (two alternatives for a delivery/check-out system) that tangible costs and benefits could not be measured. Nonetheless, after a given time-lag, the District should be able to compare purchasing costs and maintenance costs in a "before-and-after" context by utilizing a time-trend projection. (Also, the District can simply "sit-and-wait" and compare percentage decreases.) Using simulated data, cost-avoidance can be demonstrated as in the following example involving purchases and as illustrated in Figure VI:

"Time-Trend Projection", Steps Involved (Example)

a. Historical data are collected for the last 7 semesters;

b. Using statistical techniques, cost projections are made for months 8, 9, 10, 11 and 12 (this can be done via regression analysis on a month-by-month basis);

c. From month 8 through month 12, actual costs are plotted;

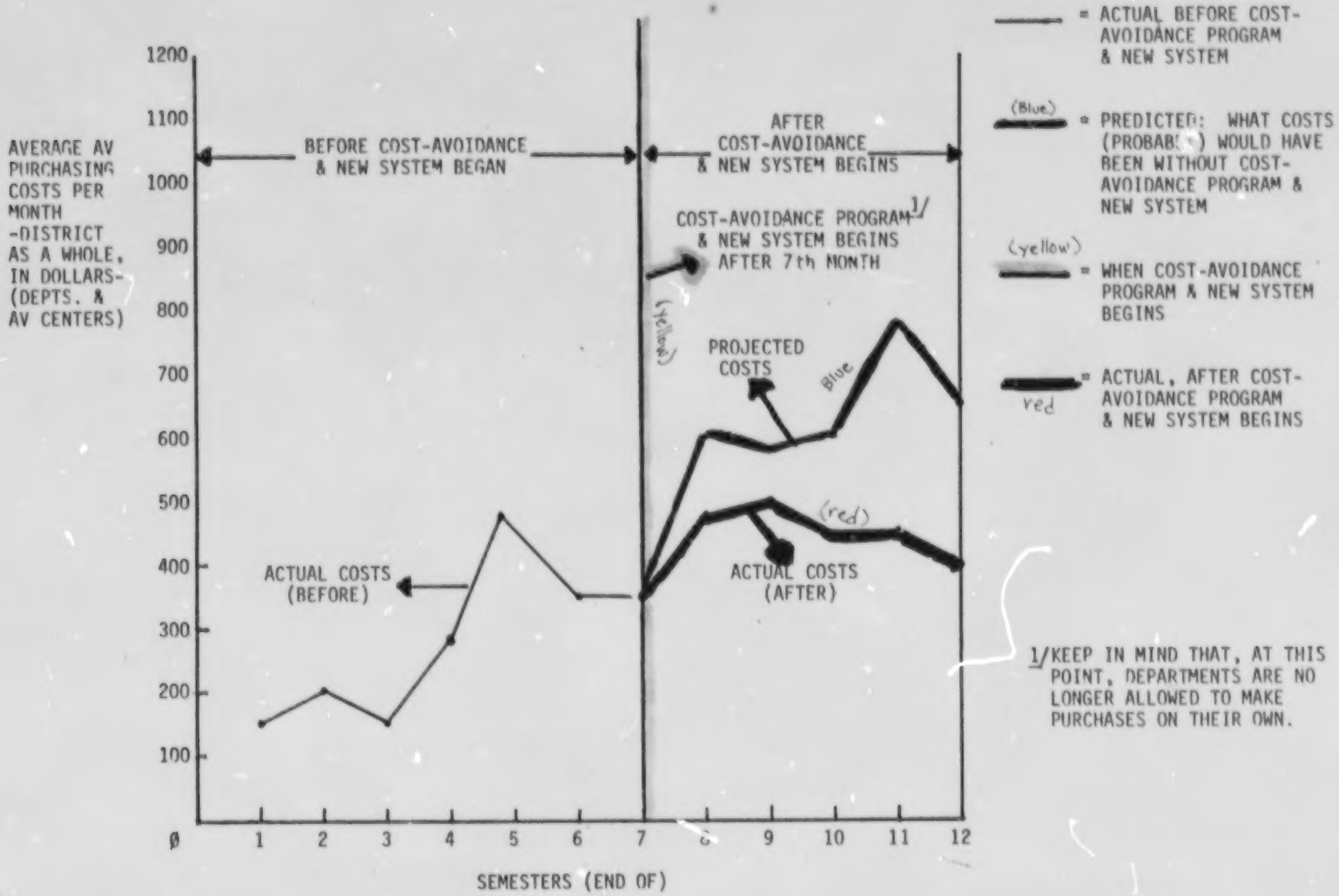
d. Net differences between projected costs and actual costs for each month (beyond month 7, when the cost-avoidance program and new system begins) represent the estimated costs that were avoided;

e. This technique assumes that increasing purchasing costs over the last several semesters before the new program/system begins have been basically linear.

This same technique can also be applied to maintenance and labor costs under the same assumptions. For example, if a centralized AV repair/maintenance shop was established to service all sites' repairs, projected maintenance costs vis a vis actual maintenance costs could be plotted against labor hours or semesters.

FIGURE VI

ATTACHMENT SECTION EIGHT
"TIME TREND ANALYSIS"



1/KEEP IN MIND THAT, AT THIS POINT, DEPARTMENTS ARE NO LONGER ALLOWED TO MAKE PURCHASES ON THEIR OWN.

2. Concept of a Centralized, Districtwide AV Repair/Maintenance Center - The District, in conjunction with the AV Committee, should consider the establishment of a centralized repair/maintenance center, perhaps located at the District's warehouse. This would include the pooling of media repair technicians so that their technical expertise could be shared. In addition, the District should consider the hiring of a technician on an hourly basis who is experienced in repair areas that currently require the District to send out to vendors (in this respect, we are assuming that, economically speaking, the cost of hiring such an individual would be offset by the savings realized in not having to send out repairs to vendors).

The advantages of such a center are:

a. Decreased downtime for AV items;

b. Decreased maintenance costs;

c. More of a production type of servicing leading to improved maintenance scheduling (the center could still, however, operate as a "cottage-industry");

d. The sharing of, and pooling of, expertise.

The primary disadvantage is that a pick-up/delivery system with a District van would be required. Envisioned are weekly pick-ups and deliveries of inoperable and repaired items to and from the sites.

3. Addressing AV Needs of Off-Campus Instructors -

Suggestions:

a. AV items to be utilized off-campus should be limited to:

1) Overheads/opaques;

2) 16mm projectors;

3) Projector screens;

4) Cassette recorders/playbacks;

5) Appropriate software per categories above.

This classification of items should be reviewed by the AV Committee as to appropriateness; perhaps it should be narrowed or expanded.

b. The off-campus instructor will follow new check-out/in procedures as can be applied.

3. Addressing AV Needs of Off-Campus Instructors (continued)

c. The instructor will pick up and return the item utilizing his/her own transportation. Reservations should be made in advance either in person or via telephone.

d. If the instructor is going to need the item on an ongoing basis, special arrangements would be made with that AV Center closest to the off-campus site.

e. The AV Committee should address the degree to which the SDUSD is cooperating in the way of a standing agreement with SDCCD. Theoretically, if a SDCCD instructor is conducting an off-campus class located at a SDUSD site, that instructor is supposed to have access to the site's AV equipment. In such cases, by the instructor having access to SDUSD AV equipment, he/she would not have to be as concerned with picking up and returning AV items to and from SDCCD sites.

4. AV Items Purchased with Grant Monies -

a. When a department has purchased a defined AV item(s) via grant money, the item should be allowed to remain with the department, <u>but only for the life of the grant</u>. Thereafter, the given AV item(s) will be forwarded to the AV Center to be under its control. It is assumed that the item(s) will always be under the District's inventory control.

b. Equipment purchased with grant money should still be reviewed by the AV Committee for recommendations on type, brand and quality of item to purchase.

c. When the equipment arrives on campus it should first be sent to the AV Center for coding and added to the inventory list. The center with the grant, location on campus and grant ending date should be recorded.

5. It is advised that the AV Committee establish a Districtwide policy stating appropriate charge-backs to departments and/or instructors resulting from damage to AV hardware and software. For example, if the damage results from normal usage, the AV Center can absorb the costs. If the damage results

5. (continued)

from an unintentional accident, the department is charged. If the damage results from gross negligence, then the department and/or the instructor is charged.

6. In addressing the needs of the Adult sites, it is suggested that the non-Adult sites implement the recommendations and after the new system has been debugged, apply it and tailor it to Adult Education's AV system insofar as possible through AV Committee efforts.

Adult Education's AV system is not left unaffected, however, if the prior recommendations are opted for. They would be affected by recommendations and suggestions involving:

a. Maintenance (viz., centralized, Districtwide Repair/Maintenance Center);

b. The utilization of selected AV items of a given site closest to their off-campus class (assuming it could not be obtained from their respective Adult site's AV system and that the class is not held at a SDUSD site);

c. The AV Committee approving/disapproving Adult purchase requests;

d. The purchasing of AV items with grant money.

7. Time Involved to Implement the Recommended Actions -

Setting an exact timeline for the recommendations is impossible at this time. Estimates, however, are:

a. Initial pooling of AV items and their coding, categorizing, and inventorying: As mentioned, the current inventories are inaccurate. Therefore, exactly what AV items are "out and around" in the departments cannot be determined, resulting in inability to calculate exact person hours involved. Research/Planning would expect, however, that this phase would not exceed three months during the summer vacation. This includes implementing whatever delivery/check-out system is chosen.

7. (continued)

b. Implementation of the cost-avoidance report: This depends on Computing Services schedule. An estimate would be three to six months.

c. Calculating potential usage hours as input into cost-avoidance system: This depends on item a. above. A rough estimate is two weeks, assuming the AV items have been incorporated into the new inventory.

Of first and foremost importance, is the establishment of the AV Committee. The committee members will, of course, need to review the study as individuals and as a group. The key concern here is that of coordination and integration of policy and procedures as recommended in the study.

It should also be noted that Facilities/Equipment and AV personnel of the District have openly expressed like concerns regarding the problems on which the study has focused. In addition, both are consumers of the study. It is therefore recommended that the AV Committee closely interface with the Director of Facilities/Equipment, as well as inventory technicians to coordinate any efforts of change.

Conclusion:

The study's recommendations, as with any study, are meant to be suggestive only. As noted, Facilities/Equipment and District AV personnel should be viewed as consumers of the study - thus, the recommendations and suggestions are not to be viewed as all-or-nothing.

A few key recommendations, nonetheless, are viewed by this office as being essential if the District is to significantly decrease costs of its AV system:

1. The establishment of the AV committee to obtain control and systemization of District AV purchases;
2. The pooling, coding, categorizing and inventorying of all defined AV items and the establishment of either recommended delivery/check-out systems to enable each AV Center to have centralized physical and informational control of AV items;
3. The establishment of a cost-avoidance system and usage standards (i.e., so many items of a given AV category per so many students) to avoid unnecessary purchases and to demonstrate costs avoided.

SECTION SIX

APPENDIX

PART ONE AND PART TWO

PART ONE

SURVEY RESULTS OF OTHER COLLEGES, UNIVERSITIES AND SCHOOLS

SECTION SIX

APPENDIX

PART ONE: Findings Based on Surveys of Other Colleges, Universities and Schools:

FIGURE I: ABBREVIATION KEYS FOR TABLES I, II AND III

TABLE I

- 16mm = 16mm Projector
- Sld Proj, Carss = Slide Projector, Carousel
- Sld Proj, Reg = Slide Projector, Regular
- Rec Plrs = Record Players
- Tape Rec/Plr, RR = Tape Recorder/Player, Reel-to-Reel
- Tape Rec/Plr, Csst = Tape Recorder/Player, Cassette
- Overhead Proj = Overhead Projector

TABLE II

- #Prm Stff 40/wk = Number of permanent staff at 40 hours/week
- #Stdnts L 20/wk = Number of Work-Studies/student assistants working 20 hours/week or less
- Prvntv Mtnc = Preventative Maintenance
- Pvt = Private Firm
- Co Ed = County Education Department

TABLE III

- Sunk costs audio/visual equipment abbreviations given above in Table I
- $\frac{\text{\# AV \$s}}{\text{\# Stdnts}}$ = Number of A/V dollars to number of students, ratio
- $\frac{\text{\# AV person hr}}{\text{\# Stdnts}}$ = Number of A/V person hours to number of students, ratio

AV RESPONSES

BASED ON A FIFTEEN QUESTION SURVEY

(Note: All Data are Approximations)

PART ONE - OVERVIEW: Question No.'s 1-7, 9, 10 & 11

1. Community College Districts Surveyed:

   A. San Mateo Community College District:

      1) Skyline College

      2) College of San Mateo

      3) Canada College

   B. Peralta Community College District:

      1) Feather River College

      2) Merritt College

      3) College of Alameda

      4) Laney College

      5) Peralta College for Non-Traditional Study

   C. San Jose Community College District:

      1) San Jose City College

      2) Evergreen Valley College

2. Table I, Overview:

   A. One-half of the campuses (N=10) generally have a centralized audio-visual system and location.

   B. Costs are "current costs":

      1) Sunk costs in equipment, +

      2) Current year's worth of labor (past years' labor are not included)

   C. Tapes, Cassettes = Cassette Recorder and/or Player

   D. Video Unit = Recorder + Playback + Monitor

   E. $\bar{X}$ Annual Labor Costs = $57,872 - for all schools

   F. $\bar{X}$ Sunk Costs Equipment = $149,791 - for all schools

3. Table II, Overview:

   A. The frequency of usage for the top three items for all ten campuses can be ranked as: 16mm utilized the most, followed by Cassette Tape Recorders/Playback; Slide Projectors, Carousel; Video Units; Overheads; and Record Players.

3. Table II, Overview: (continued)

B. $\bar{X}$ Number of full-time staff per audio-visual department = 3

$\bar{X}$ Number of part-time/Work-Study staff per audio-visual department = 8

C. $\bar{X}$ Number of times preventative maintenance is performed (all schools) = 1.7 times per year

D. All campuses perform their own minor repair; six of the ten perform major repair. When repairs are beyond the capacity of the campus (this applies to eight of the ten), four will send out to private firms - the remaining four will send out to the County Education Department.

4. Table III, Overview:

A. The number of audio-visual dollars/the number of students figures are based on current year's worth of labor costs + sunk costs in equipment.

B. The number of audio-visual person hours/the number of students figures are based on the departments' number of full-time personnel hours + part-time personnel hours for one week.

C. For all campuses, the $\bar{X}$ number of audio-visual dollars/the number of students = $24.19. The highest campus figure is $124.96; the lowest campus figure is $4.08, giving a range of $120.88.

D. For all campuses, the $\bar{X}$ number of audio-visual person hours/number of students = .025 person hours. The highest number of audio-visual person hours per student is .036; the lowest is .007, giving a range of .029 hours. Thus, the campus with the highest audio-visual person hours can give each 100 of their students 3.6 hours worth of audio-visual time in labor, whereas the campus with the lowest audio-visual time can only give about 45 minutes worth of audio-visual time in labor to each of their students.

Question #15 - What is your procedure for the purchasing of audio-visual equipment?

	f
- Audio-visual department given lump sum, equipment purchased according to equipment needs.	8
- Structured budget per items needed; no post budget co-mingling or transfer of monies.	2
	N=10 responses

PART TWO: Question No.'s 8, 12, 13 & 14

Question #8: Are there any problems in staffing the audio-visual department?

	f
- Not enough staff	5
- No problems	5

N=10 responses

Question #12: What do you do if equipment is lost or is returned when damaged?

	f
- Audio-visual department normally absorbs costs, but if gross negligence, department must pay or instructor must pay.	4
- Audio-visual department always absorbs costs.	5
- No problems with instructors or departments.	1

N=10 responses

Question #13: How are off-campus audio-visual needs handled?

	f
- Equipment checked out to instructor, or equipment left at off-campus key locations.	1
- Equipment always checked out to instructor	6
- Equipment checked out to instructor and/or courier system picks up/delivers.	2
- Equipment kept at off-campus key locations and/or courier system picks up/delivers.	1

N=10 responses

Question #14: How do your multi-campus sites handle their audio-visual set-up?

Peralta Community College District:

No centralized "district" audio-visual location; all district audio-visual decentralized to each campus' own system.

See Table I for each campus' system of location.

San Jose Community College District:

as per Peralta's system.

San Mateo Community College District:

as per Peralta's system.

TABLE I: AV EQUIPMENT LOCATION, COSTS, AND INVENTORY DESCRIPTION BY DISTRICT

District	CAMPUS	AV STORAGE		COSTS		INVENTORY DESCRIPTION AND AMOUNTS							
		ONE	MULTI-PLE	ANNUAL LABOR	SUNK COSTS EQUIPMENT	16mm	Sld Proj, Carss	Sld Proj, Reg	Rec Plrs	Tape Rec/ Plr, RR	Tape Rec/ Plr, Csst	Over-head Proj	Video Units
SAN MATEO COMMUNITY COLLEGE DISTRICT	SKYLINE		✓	$109,680	$131,705	20	124		12	6	146	24	10
	SAN MATEO		✓	$92,320	$53,850	24	15		8	4	30	10	9
	CANADA		✓	$89,856	$46,070	15	8		6	6	20	20	11
PERALTA COMMUNITY COLLEGE DISTRICT	FEATHER RIVER	✓		$10,800	$4,910	1	4		2		4	4	3
	MERRITT		✓	$30,000	$40,950	18	10		20	9	30	20	3
	ALAMEDA	✓		$74,731	$800,000	20	30	1	15	7	190	20	12
	LANEY	✓		$45,000	$40,270	28	14		10	12	12	6	2
	PERALTA COLL. NON TRAD.		✓	$17,136	$17,560	5	10		2		10	3	8
SAN JOSE COMMUNITY COLLEGE DISTRICT	SAN JOSE CITY	✓		$83,600	$208,002	30	89		52	64	519	25	10
	EVER-GREEN VALLEY	✓		$25,600	$154,600	25	70		10	4	250	55	16

65

66

TABLE II: AV EQUIPMENT USAGE FREQUENCY RANKED, NUMBER OF STAFF, ASSISTANCE TO DEPTS, CHARGE TO DEPTS, AND MAINTENANCE BY DISTRICT

District	CAMPUS	USAGE RANKED (top 3)			NUMBER OF STAFF		Providing of AV Assistance				Are Depts Charged ?	MAINTENANCE				
		1	2	3	#Prm Stff 40/wk	# Stdnts ≤ 20/wk	Delivers	Sets up	Operates	Sign out System		Prvntv Mtnc	Minor Repair	Major Repair	Sends Out Pvt.	Sends Out Co Ed
SAN MATEO COMMUNITY COLLEGE DISTRICT	SKYLINE	16 mm	Video Units	Slide Proj., Carss.	2 at 2/3 Time 3 at Fulltime 1 at 1/4 Time	15	✓			✓	NO	Semes-terly & Yearly	✓	✓	✓	
	SAN MATEO	16 mm	Tape (Audio) Cssts.	Slide Proj., Carss.	4	10	✓	✓		✓	NO	During Summers	✓	✓		
	CANADA	Video Units	16 mm	Tape Rec. Cssts.	5	2 Every Hour a.m.s & p.m.s	✓	✓		✓	NO	Every Year	✓	✓	✓	
PERALTA COMMUNITY COLLEGE DISTRICT	FEATHER RIVER	Slide Proj., Carss.	Tape Rec. Cssts.	16 mm	1		✓	✓	✓	✓	NO	2 x per Year	✓			✓
	MERRITT	16 mm	Rec. Players	Tape Rec. Cssts.	1	7		✓		✓	NO	Semes-terly	✓			✓
	ALAMEDA	16 mm	Tape Rec. Cssts.	Video Units	4	19	✓	✓		✓	NO	Every Year	✓	✓	✓	
	LANEY	16 mm	Slide Proj., Carss.	Tape Rec. Cssts.	3	3	✓	✓		✓	NO	Every Semester	✓			✓
	PERALTA COLL. NON TRAD.	16 mm	Slide Proj., Carss.	Video Units	1	1	✓	✓	✓	✓	NO	Every Semester	✓			✓
SAN JOSE COMMUNITY COLLEGE DISTRICT	SAN JOSE CITY	16 mm	Tape Rec. Cssts.	Video Units	4	12	✓			✓	NO	2 x per Year	✓	✓	✓	
	EVER-GREEN VALLEY	Over-heads	16 mm	Slide Proj., Carss.	2	5	✓	✓		✓	NO	Semes-terly	✓	✓		

TABLE III: SUNK COSTS AV EQUIPMENT BY ITEM, AV DOLLAR TO STUDENT RATIO, AND AV PERSON HOURS TO STUDENT RATIO .

District	CAMPUS	SUNK COSTS AUDIO/VISUAL EQUIPMENT							#AV $s / # Stdnts	AV #person hr / # Stdnts
		16mm	Sld Proj, Carss/Reg	Rec Plrs	Tp Rec/Plr, RR	Tp Rec/Plr, Csst	Ovrhd Proj	Video Equip		
SAN MATEO COMMUNITY COLLEGE DISTRICT	SKYLINE	$16,000	$49,600	$2,275	$1,200	$40,150	$6,480	$16,000	$33.33	.025
	SAN MATEO	$16,800	$3,750	$1,200	$3,200	$9,000	$1,500	$18,400	$9.74	.020
	CANADA	$12,000	$3,320	$1,050	$1,200	$5,500	$5,400	$17,600	$17.99	.036
PERALTA COMMUNITY COLLEGE DISTRICT	FEATHER RIVER	$500	$240	$350	-0-	$240	$1,080	$2,500	$14.28	.036
	MERRITT	$14,400	$3,300	$3,000	$1,800	$8,250	$5,400	$4,800	$7.10	.014
	ALAMEDA	$16,000	$15,500	$3,000	$1,400	$52,250	$5,400	$300,000	$124.96	.066
	LANEY	$22,400	$5,600	$1,750	$2,400	$3,300	$1,620	$3,200	$8.35	.016
	PERALTA COLL. NON TRAD.	$4,000	$3,300	$300	-0-	$2,750	$810	$6,400	$4.08	.007
SAN JOSE COMMUNITY COLLEGE DISTRICT	SAN JOSE CITY	$22,500	$24,000	$13,000	$32,500	$104,452	$6,750	$4,800	$23.14	.027
	EVER-GREEN VALLEY	$20,000	$23,100	$1,500	$800	$68,750	$14,850	$25,600	$27.72	.024

AV RESPONSES

BASED ON A FIFTEEN QUESTION SURVEY

(Note: All Data are Approximations)

PART ONE - OVERVIEW

I. Community College Districts Surveyed:

A. Contra Costa Community College District:

1. Contra Costa College
2. Diablo Valley College
3. Los Medanos College

B. Los Angeles Community College District:

1. East Los Angeles College
2. Los Angeles City College
3. Los Angeles Harbor College
4. Los Angeles Mission College
5. Los Angeles Pierce College
6. Los Angeles Southwest College
7. Los Angeles Trade Technical College
8. Los Angeles Valley College
9. West Los Angeles College

C. Los Rios Community College District:

1. American River College
2. Cosumnes River College
3. Sacramento City College

D. North Orange County Community College District:

1. Cypress College
2. Fullerton College

II. Table I, Overview:

A. Out of the seventeen campuses contacted:

Centralized Systems	12
Non-centralized Systems	5

B. The costs are "current costs":

1. Sunk costs in equipment
2. Current year's worth of labor (past years' labor are not included)

II. Table I, Overview: (continued)

C. Slide projectors are the carousel and conventional models.

D. Tape recorders are the cassette and the reel-to-reel.

E. Video units consist of recorder, playback and monitor.

F. The total 17 campus' $\overline{X}$ labor costs are $5,877.31.

G. The total 17 campus' $\overline{X}$ sunk equipment costs are $4,220.55.

III. Table II, Overview:

A. The frequency of usage for the top three items for all seventeen campuses are ranked as follows:

1. 16mm Projectors
2. Slide Projectors
3. Tape Recorders

B. The average number of full-time staff per audio-visual department = 6. The average number of part-time/Work-Study staff - - - - - - - - = 10, per audio-visual department.

C. The average number of times preventative maintenance is performed (all campuses) = once a year [during the summer]

D. Rate of Repairs:

	In-House	Outside Public Agency	Private Vendor
Minor Repairs	17	-0-	-0-
Major Repairs	17	-0-	4*

*Only on occasion - when equipment completely exceeds their capabilities.

IV. Table III, Overview:

A. The number of audio-visual dollars/the number of students figures are based on current year's worth of labor costs and sunk costs in equipment.

B. The number of audio-visual person hours/the number of students figures are based on the departments' number of full-time personnel hours and part-time personnel hours for one week.

IV. Table III, Overview: (continued)

C. For all seventeen campuses, the average number of audio-visual dollars/the number of students = $13.67.

The highest campus figure is = $53.03

The lowest campus figure is = $ 4.17

This gives a range of $48.86.

D. For all campuses, the average number of audio-visual person hours/number of students - .031 person hours. The highest number of audio-visual person hours per student is .192; the lowest is .002, giving a range of .190 hours. Thus, the campus with the highest audio-visual person hours can give each 100 of their students 19.2 hours worth of audio-visual time on labor, whereas the campus with the lowest audio-visual time can only give about 1.2 minutes worth of audio-visual time in labor to each of their 100 students.

PART TWO: Question No.'s 8, 12, 13 & 14

Question #8: Are there any problems in staffing the audio-visual department?

	f
- Not enough staff	1
- No problems	11
- Work-Study Student Scheduling	5

N=17 responses

Question #12: What do you do if equipment is lost or is returned broken/damaged?

	f
- Audio-visual department normally absorbs costs, but if gross negligence, department must pay or instructor must pay	15
- Audio-visual department always absorbs	1
- No problems with instructors or departments	1

N=17 responses

Question #14: How do your multi-campus sites handle their audio-visual set-ups?

Los Angeles Community College District:

No centralized "district" audio-visual location. All district audio-visual decentralized to each campus' own system. (See Table I for each campus' system of location.)

Contra Costa Community College District:

As per Los Angeles' system.

Los Rios Community College District:

As per Los Angeles' system.

North Orange County Community College District:

As per Los Angeles' system.

Question #15: What is your procedure for the purchasing of audio-visual equipment?

	f
- Audio-visual department given lump sums, but instructional departments requirements noted. Equipment purchased according to equipment needs.	13
- Audio-visual department and instructional departments have equal input concerning audio-visual equipment purchases.	2
- Instructional departments have total control over audio-visual equipment purchases.	2

N=17 responses

TABLE I: AV EQUIPMENT LOCATION, COSTS, AND INVENTORY DESCRIPTION BY DISTRICT

District	CAMPUS	AV STORAGE		COSTS		INVENTORY DESCRIPTION AND AMOUNTS					
		ONE	MULTI-PLE	ANNUAL LABOR	SUNK COSTS EQUIPMENT	16mm	Slide Projectors (Reg. & Carss.)	Rec Plrs	Tape Rec/Players	Over-head Proj	Video Units
LOS ANGELES COMMUNITY COLLEGE DISTRICT	EAST L.A. COLL.	✓		$15,224	$71,600	40	50	35	38	-0-	-0-
	L.A. CITY COLL.	✓		$96,896	$58,300	115	50	30	50	30	-0-
	L.A. HARBOR COLL.		✓	$128,240	$17,210	7	8	6	4	3	3
	L.A. MISSION COLL.	✓		$42,448	$31,960	11	16	5	36	8	3
	L.A. PIERCE COLL.	✓		$72,896	$31,500	21	13	28	13	-0-	-0-
	L.A. SOUTH-WEST COLL.	✓		$33,672	$15,000	8	10	11	7	-0-	-0-
	L.A. TRADE TECH. COLL.		✓	$91,344	$28,780	20	10	-0-	20	14	-0-
	L.A. VALLEY COLL.	✓		$134,688	$91,800	50	50	20	60	40	-0-
	WEST L.A. COLL.	✓		$182,152	$231,800	16	16	20	100	100	100

TABLE I: AV EQUIPMENT LOCATION, COSTS, AND INVENTORY DESCRIPTION BY DISTRICT

District	CAMPUS	AV STORAGE		COSTS		INVENTORY DESCRIPTION AND AMOUNTS					
		ONE	MULTI-PLE	ANNUAL LABOR	SUNK COSTS EQUIPMENT	16mm	Slide Projectors (Reg. & Carss.)	Rec Plrs	Tape Rec/Players	Over-head Proj	Video Units
CONTRA COSTA COMMUNITY COLLEGE DISTRICT	CONTRA COSTA COLLEGE	✓		$49,792	N/A	←	----------	HEAVY	----------		→
	DIABLO VALLEY COLLEGE		✓	$161,912	$162,400	73	122	37	177	-0-	-0-
	LOS MEDANOS COLLEGE	✓		$202,480	$52,100	15	25	3	15	-0-	15
LOS RIOS COMMUNITY COLLEGE DISTRICT	AMERICAN RIVER COLLEGE	✓		$131,376	$35,500	40	37	14	55	-0-	-0-
	COSUMNES RIVER COLLEGE	✓		$76,120	$81,000	25	50	50	50	-0-	10
	SACRAMENTO CITY COLLEGE	✓		$80,800	$144,790	148	128	56	217	97	-0-
NORTH ORANGE COUNTY COMMUNITY COLLEGE DIST.	CYPRESS COLLEGE		✓	$95,224	N/A	←	---------- APPROXIMATELY 4,000 PIECES OF EQUIPMENT ----------				→
	FULLERTON COLLEGE		✓	$103,280	$166,000	65	100	20	300	-0-	-0-

TABLE II: AV EQUIPMENT USAGE FREQUENCY RANKED, NUMBER OF STAFF, ASSISTANCE TO DEPTS, CHARGE TO DEPTS, AND MAINTENANCE BY DISTRICT

District	CAMPUS	USAGE RANKED (top 3)			NUMBER OF STAFF		Providing of AV Assistance				Are Depts Charged ?	MAINTENANCE				
		1	2	3	#Prm Stff 40/wk	# Stdnts ≤ 20/wk	Delivers	Sets up	Operates	Sign out System		Prvntv Mtnc	Minor Repair	Major Repair	Sends Out: Pvt	Sends Out: Co Ed
LOS ANGELES COMMUNITY COLLEGE DISTRICT	EAST L.A. COLL.	16 mm	Slide Proj.	---	1	1					NO	✓	✓	✓		
	L.A. CITY COLL.	16 mm	---	---	7	4					NO	✓	✓	✓		
	L.A. HARBOR COLL.	16 mm	---	---	8	10	✓			✓	NO	✓	✓	✓		
	L.A. MISSION COLL.	16 mm	Tape Rec.	Slide Proj.	3	2					NO	✓	✓	✓		
	L.A. PIERCE COLL.	16 mm	---	---	5	4	✓	✓	✓	✓	NO	✓	✓	✓		
	L.A. SOUTH-WEST COLL.	16 mm	---	---	2	3	✓	✓	✓	✓	NO	✓	✓	✓		
	L.A. TRADE TECH. COLL.	16 mm	Over-head	---	6	6					NO	✓	✓	✓		
	L.A. VALLEY COLL.	16 mm	Slide Proj.	Tape Rec.	8	12	✓	✓		✓	NO	✓	✓	✓		
	WEST L.A. COLL.	16 mm	Slide Proj.	Video Units	9	23	✓	✓	✓	✓	NO	✓	✓	✓		

TABLE II: AV EQUIPMENT USAGE FREQUENCY RANKED, NUMBER OF STAFF, ASSISTANCE TO DEPTS, CHARGE TO DEPTS, AND MAINTENANCE BY DISTRICT

District	CAMPUS	USAGE RANKED (Top 3)			NUMBER OF STAFF		Providing of AV Assistance				Are Depts Charged ?	MAINTENANCE				
		1	2	3	#Prm Stff 40/wk	# Stdnts ≤ 20/wk	Delivers	Sets up	Operates	Sign out System		Prvntv Mtnc	Minor Repair	Major Repair	Sends Out: Pvt	Co Ed
CONTRA COSTA COMMUNITY COLLEGE DISTRICT	CONTRA COSTA COLLEGE	16 mm	Over-head	---	2	8	✓	✓	✓	✓	NO	✓	✓	✓	✓	
	DIABLO VALLEY COLLEGE	16 mm	Slide Proj.	Tape Rec.	10	13	✓	✓		✓	NO	✓	✓	✓	✓	
	LOS MEDANOS COLLEGE	16 mm	Video Units	---	11.5	20	✓			✓	NO	✓	✓	✓		
LOS RIOS COMMUNITY COLLEGE DISTRICT	AMERICAN RIVER COLLEGE	16 mm	---	---	4.5	24	✓			✓	NO	✓	✓	✓	✓	
	COSUMNES RIVER COLLEGE	16 mm	---	---	5	5	✓	✓	✓	✓	NO	✓	✓	✓		
	SACRA-MENTO CITY COLLEGE	16 mm	Tape Rec.	---	5	20				✓	NO	✓	✓	✓		
NORTH ORANGE COUNTY COMMUNITY COLLEGE DIST.	CYPRESS COLLEGE	16 mm	Slide Proj.	---	6	1					NO	✓	✓	✓		
	FULLERTON COLLEGE	16 mm	Slide Proj.	Tape Rec.	8	7	✓	✓	✓	✓	NO	✓	✓	✓	✓	

TABLE III: SUNK COSTS AV EQUIPMENT BY ITEM, AV DOLLAR TO STUDENT RATIO, AND AV PERSON HOURS TO STUDENT RATIO

District	CAMPUS	SUNK COSTS AUDIO/VISUAL EQUIPMENT						#AV $s / # Stdnts	AV #person h / # Stdnts
		16mm	Sld Proj, Carss/Reg	Rec Plrs	Tape Rec/Players (RR & Csst.)	Ovrhd Proj	Video Equip		
LOS ANGELES COMMUNITY COLLEGE DISTRICT	EAST L.A. COLL.	$32,000	$25,000	$7,000	$7,600	-----	-----	4.17	.002
	L.A. CITY COLLEGE	$9,200	$2,500	$6,000	$10,000	$8,100	-----	7.75	.015
	L.A. HARBOR COLLEGE	$5,600	$4,000	$1,200	$800	$810	$4,800	12.12	.039
	L.A. MISSION COLLEGE	$8,800	$8,000	$1,000	$7,200	$2,160	$4,800	23.25	.046
	L.A. PIERCE COLLEGE	$16,800	$6,500	$5,600	$2,600	-----	-----	4.74	.011
	L.A. SOUTH-WEST COLLEGE	$6,400	$5,000	$2,200	$1,400	-----	-----	16.22	.041
	L.A. TRADE TECH. COLLEGE	$16,000	$5,000	-----	$4,000	$3,780	-----	7.06	.019
	L.A. VALLEY COLLEGE	$40,000	$25,000	$4,000	$12,000	$10,800	-----	87.11	.192
	WEST L.A. COLLEGE	$12,800	$8,000	$4,000	$20,000	$27,000	$160,000	41.39	.070

TABLE III: SUNK COSTS AV EQUIPMENT BY ITEM, AV DOLLAR TO STUDENT RATIO, AND AV PERSON HOURS TO STUDENT RATIO

District	CAMPUS	SUNK COSTS AUDIO/VISUAL EQUIPMENT						#AV $s / # Stdnts	AV #person h / # Stdnts
		16mm	Sld Proj, Carss/Reg	Rec Plrs	Slide Projectors (Reg. & Carss.)	Ovrhd Proj	Video Equip		
CONTRA COSTA COMMUNITY COLLEGE DISTRICT	CONTRA COSTA COLLEGE	NOT AVAILABLE						62.24	.025
	DIABLO VALLEY COLLEGE	$58,400	$61,000	$7,400	$35,400	None	None	16.22	.030
	LOS MEDANOS COLLEGE	$12,000	$12,500	$	$3,000	None	$24,000	53.03	.158
LOS RIOS COMMUNITY COLLEGE DISTRICT	AMERICAN RIVER COLLEGE	$3,200	$18,500	$2,800	$11,000	None	None	8.68	.028
	COSUMNES RIVER COLLEGE	$20,000	$25,000	$10,000	$10,000	None	$16,000	31.42	.055
	SACRAMENTO CITY COLLEGE	$118,400	$64,000	$11,200	$11,200	$26,190	None	15.04	.033
NORTH ORANGE COUNTY COMMUNITY COLLEGE DIST.	CYPRESS COLLEGE	NOT AVAILABLE						7.93	.021
	FULLERTON COLLEGE	$52,000	$50,000	$4,000	$60,000	None	None	14.31	.022

TABLE IV

AV SQUARE FOOTAGE BY SELECTED COLLEGES
OF THE SURVEY

COLLEGE	A/V FACILITY SQUARE FOOTAGE
Canada College	2,000
Diablo Valley College	10,064
Fullerton College	4,588
Los Angeles Harbor College	15,000
Los Angeles Trade Tech. College	9,000
San Mateo College	10,240
Skyline College	6,796

TABLE V

STUDENT POPULATION (AS OF 2/80) BY COLLEGE DISTRICT,
ALL COLLEGES SURVEYED

COLLEGE DISTRICT	STUDENT POPULATION
San Mateo Community College District:	
Skyline College	7,242
College of San Mateo	15,000
Canada College	7,680
Peralta Community College District:	
Feather River College	1,100
Merritt College	10,000
College of Alameda	.7,000
Laney College	10,200
Peralta College for Non-Trad. Study	8,500
San Jose Community College District:	
San Jose City College	12,600
Evergreen Valley College	6,500
Los Rios Community College District:	
American River College	19,222
Cosumnes River College	5,000
Sacramento City College	15,000
Contra Costa Community College District:	
Contra Costa College	8,000
Diablo Valley College	20,000
Los Medanos College	4,800

TABLE V (Continued)

STUDENT POPULATION (AS OF 2/80) BY COLLEGE DISTRICT,
ALL COLLEGES SURVEYED

COLLEGE DISTRICT	STUDENT POPULATION
Los Angeles Community College District:	
East Los Angeles College	20,800
Los Angeles City College	20,000
Los Angeles Harbor College	12,000
Los Angeles Mission College	3,200
Los Angeles Pierce College	22,000
Los Angeles Southwest College	3,000
Los Angeles Trade Technical College	17,000
Los Angeles Valley College	2,600
West Los Angeles College	10,000
North Orange County Community College District:	
Cypress College	12,000
Fullerton College	18,806
San Diego State University	31,000

SAN DIEGO STATE UNIVERSITY AUDIO-VISUAL TOUR

1. All audio-visual equipment centralized in Learning Resource Center, southeast end of campus.

2. Audio-visual System Costs:

   a. Yearly labor (approximate) - Full-time personnel $ 77,600

      Part-time/Work-Study personnel 17,856

      TOTAL LABOR $ 95,456

   b. Sunk costs equipment (approximate):

121	16mm	$ 96,800
58	Slide Proj., Regular	19,140
94	Slide Proj., Carousel	47,000
38	Record Players	5,700
39	Tape Recorders/Playbacks, Reel-to-Reel	7,800
80	Tape Recorders/Playbacks, Cassette	22,000
63	Overheads	17,010
3	Video Units	4,800
	TOTAL SUNK COSTS	$220,250

   c. Total audio-visual system cost. $315,706

3. Some departments can purchase their own audio-visual equipment (viz., Art Department requiring several carousels). However, if the department does not utilize the equipment to its potential, the equipment is appropriated by the Audio-visual Department and is incorporated into their inventory. Moreover, if a department purchases an audio-visual item, it can be stored with the department or at the audio-visual center. Also, the audio-visual center will do repairs on department-purchased equipment.

4. The audio-visual items receiving the most use are 16mm and Carousel slide projectors, followed by overheads.

5. The staff is composed of 5 full-time personnel and 4 student workers. Staffing has decreased since Proposition 13.

6. Audio-visual offers delivery and setting up of equipment, but will not actually operate it. There is no charge for this.

7. A rigid control system has been established using a:

   a. Check-out slip, which can be "phoned in", sent in by campus mail, or delivered in person. The check-out slip indicates whether:

      1) the instructor will pick up the item;

      2) the audio-visual item will be delivered to the department office;

      3) the audio-visual item will be delivered to the room and set up.

   b. An internal sign-out book, indicating:

      1) time
      2) room
      3) instructor
      4) date
      5) item
      6) what key is needed to get item from given storage locker.

8. Maintenance: Both minor and major, are performed. However, if the item is beyond their technical capacity, it is sent out to a private firm.

9. A charge is made to the department if an item is damaged.

10. For off-campus needs, the equipment is checked out to the responsibility of the instructor. Again, the instructor's department must absorb any damage costs.

11. Purchasing of audio-visual items are made through the audio-visual supply budget. Money is given in lump sums; purchases are made according to needs and budget constraints.

12. Approximately 2,000 films are available and are listed in a master list for convenience of instructors. Films not on the list can be purchased by audio-visual for other departments at their request.

13. There are viewing rooms for instructors to preview feasibility of showing films.

14. Films, 16mm projectors, slide projectors, overheads, etc., are rented to clubs and groups.

15. There is a rewind/inspection machine which repairs films and reviews for damage.

AUDIO-VISUAL SET-UPS AT OTHER SITES

UNIFIED SCHOOL DISTRICT (292-4277, x24) Fred Gerlach

1. Most schools maintain their own Media Center.
2. The equipment at the central office is usually the older models after schools have updated their equipment.
3. They carry all types of equipment, including microscopes, CPR equipment, projectors, etc.
4. When a school sends their equipment to be repaired they request a loaner from the central office:
   a. The equipment is sent out via delivery truck once a week and pick up of equipment is done once a week.
   b. Some teachers pick up their own equipment if it's not too large.

GROSSMONT COMMUNITY COLLEGE DISTRICT (465-1700)

1. All media-type equipment is controlled by one department. However, some equipment (motion picture projectors) are left in class during the entire semester and stored in the media department during summer and spring break. At this time general maintenance is performed. This equipment is not to be moved from the classroom by anyone other than media staff.
2. The delivery of equipment is handled by students. Two (2) students are available at all times to handle delivery and set up.
3. There is a check-out counter for software items (tapes, etc.). Log book is signed and dated and return time recorded.
4. Staffing (other than student help):

   Day Shift - 2 full-time personnel

   Evening Shift - 1 full-time person
5. Maintenance work is performed by the 2 full-time people. Major repairs are sent out.
6. No charge-backs.
7. Electronics equipment is handled by a separate department.

UNIVERSITY OF SAN DIEGO (291-6480)

1. All equipment is headquartered in one basement storeroom.
2. Check-out system:
   a. Faculty check-out--fill out request form and only allowed to keep the equipment for 3 days.
   b. Delivery/set-up--3 graduate assistants work 20 hours/week handling this function.
   c. Pick up of equipment--there are storage rooms located throughout the campus where equipment can be locked up by AV personnel. Good for heavy use areas.
3. The Nursing Program has its own media center.
4. No charge-backs.
5. Staffing:
   a. Head librarian oversees media center--also one (1) supervisor, one (1) full-time person, three (3) graduate students and various work-study students.
6. Maintenance:
   a. Only general cleaning and minor repairs done by staff; all other work sent out.

PALOMAR COMMUNITY COLLEGE (744-1150) Lee Hoffman

1. There has been a reduction in staff and services due to Proposition 13.
2. Many departments have their own small equipment (such as recorders); however, major equipment is maintained by Media Center.
3. Check-out system:
   a. Delivery/set-up of equipment has been eliminated (student aides terminated--Proposition 13).
   b. Instructors must reserve equipment, check out and sign/date log book and pick up their own equipment.
      b-1) Many problems with this system: general abuse, breakage, equipment brought back late or not returned at all, resulting in staff searching for equipment.

PALOMAR COMMUNITY COLLEGE (continued)

b-2) Reservations do not work--some come in early for equipment and get upset at staff because someone else is bringing it back late (causes interruptions in getting other work done). Forms not filled out properly.

4. No charge-backs for usage, but do charge back for repairs.
5. Maintenance and repairs done by full-time staff.
6. Staffing:
   a. 3 full-time staff (day and night shifts)
   b. 2 students - multimedia auditorium work
7. Video taping equipment is the only equipment they set up.

UCSD

1. Campus audio-visual (person in charge - Bill Haggler) Humanities Building #458, 452-4330.
   a. Maintains projectors, sound system and other equipment.
   b. Coordinates projection booths, which are the size of two classrooms, for presentations to large groups.
   c. Distributes AV equipment for campus.
   d. AV equipment rates:
      d-1) $5.50 a day for projectors, slide projectors, etc.
      d-2) $4.00 charge for day delivery of equipment.
      d-3) $5.00 charge for evening delivery of equipment.
      d-4) $6.00 an hour charge for equipment operator.
   e. No video equipment/materials available.
2. Slide/photograph collection (person in charge - Karen Ozudogru), 452-4811.
   a. Maintains strictly the slides and photos.
   b. Individuals with campus AV slide projectors must come to slide/photograph collection for slides.

UCSD (continued)

3. Medical AV library - 452-4536.
   a. Maintains AV medical instructional equipment (only projectors, slides and tapes).
   b. No video.
   c. Only available to medical personnel.
   d. Centrally located equipment.

SOUTHWESTERN - 421-6700

1. Equipment available on an hourly basis.
2. Equipment all centrally located and maintained.
3. All AV available, including limited video.
4. AV equipment instructions available, but no AV equipment operators available.
5. No charge-backs.

SAN DIEGO COUNTY

1. Each department requiring AV equipment orders and via purchase orders, has any repairs done.
2. No centrally located service/storage center.
3. Tape, video, slides and film projectors used.
4. Equipment by reservation.

OVERVIEW OF TABLE VI

"Alternatives Selected and Rejected Regarding Inventory (Central Control), Purchases and Return of Equipment at End of Term/Year. Based on Information From AV Survey."

1. Page 70 gives 44 alternatives as to AV system's inventory, purchasing, and term/year-end return.
   ([4] [3] [2] [2]) - 4 = 44
2. "✓" denotes "could be", "X" denotes "should be" in terms of meeting District's needs under future/present budget constraints and need of District to avoid duplication of purchases, etc.
3. Two alternatives were recommended, each of which may be opted for, depending upon the needs of the site.

   ALTERNATIVE ONE:

   a. AV items stored in one location (assuming a delivery system is available);
   b. Departments and AV center cannot make purchases without Districtwide AV Committee's consent/approval;
   c. There is no need to return AV items at end of year or term (viz., for repairs, preventative maintenance or inventory) to AV Center as they are stored in one location;
   d. All AV items are under a centralized inventory (viz., AV items controlled by AV Center, not by any department) of the AV Center.

   ALTERNATIVE TWO:

   a. AV items are stored in multiple locations, with the majority of the items being stored at the AV Center. The most frequently used AV items, however, are to be stored in strategically located lockers/closets, access to which can only be gained via an AV controlled key check-out system;
   b. Departments and AV Center cannot make purchases without the Districtwide AV Committee's consent/approval;

ALTERNATIVE TWO: (continued)

c. At the end of every term/year, AV items that had been stored in lockers/closets are returned to the AV Center (repairs, preventative maintenance, inventory);

d. All AV items are under a centralized inventory controlled by AV Center.

TABLE VI AV SYSTEMS AS OBSERVED FROM AV SURVEY

AND POSSIBLE COMBINATIONS NOT OBSERVED

INVENTORY, PURCHASES, END TERM RETURN / STORAGE		ALL ITEMS UNDER AV'S INVENTORY	SPLIT INVENTORY: -SOME DEPT'S. -SOME AV'S	ALL AV UNDER DEPT'S. INVENTORY	DEPTS. MAKE PURCHASES WITHOUT AV COMMITTEE'S CONSENT	DEPTS. CANNOT MAKE PURCHASES WITHOUT AV COMMITTEE'S CONSENT	ALL AV EQUIP. RETURNED TO AV CENTER END OF TERM/YEAR?	
							YES	NO
ONE LOCATION		X	√	UNOBSERVED	√	X	N/A (Already in one Location)	N/A
MULTIPLE LOCA-TIONS	MARGINALLY CENTRALIZED	√	√	√	√	√	√	√
	VERY CENTRALIZED	X	√	UNOBSERVED	√	X	X	√
SATELLITE LOCATIONS, NO CENTRALIZATION IN AV CENTER		√	√	√	√	√	√	√

X DENOTES RECOMMENDED SYSTEMS

√ DENOTES SYSTEMS NOT RECOMMENDED

PART TWO

FINDINGS BASED ON SURVEY OF

DISTRICT'S AV SYSTEM

APPENDIX

PART TWO: Findings Based on Survey of the District's AV System.

CITY COLLEGE: Overview based on survey findings:

1. Square footage: approximately 1,700
2. Staffing:

   1 - AV Clerk II (Evening)

   1 - AV Clerk I

   1 - Media Production Technician

   1 - AV Librarian

   2 - Hourly (2 CAI's M-Th evening) (1 CAII F-S)

   Do not use work-study students since they are not dependable and it is hard to coordinate schedules.
3. Location: First floor of library
4. Purchasing Process: All departments can purchase their own equipment which is stored in the department main office or locked in a cabinet in a classroom. AV purchase requests do not have to be screened by any AV-knowledgeable personnel to determine if:

   a. it is best for their needs;
   b. it is easy to use and maintain;
   c. there is duplication of equipment already available in the AV Department or elsewhere on campus;
   d. potential usage of items in the category is optimum.

   Equipment can also be purchased with federal grant money. In such cases, the departments do not allow borrowing of the equipment. In addition, they do not seem to take into consideration that when the grant ends, the equipment legally becomes District property. The AV Department also makes its own purchases of equipment.

   This random form of AV purchasing has resulted in duplication of equipment,

4. (continued)

unnecessary purchases due to "hiding" or "territorial rights", purchasing more expensive or more technical equipment than is really needed, and purchasing of expensive equipment that is used only monthly or once per semester.

5. Delivery/Check-Out System of Equipment: When a piece of equipment is reserved, the AV staff will thread the film and prepare the machine for the instructor to pick up. The AV Department does not deliver equipment except to San Diego High School for evening classes. There have been problems with instructors not returning equipment. In these instances the Media Production Technician has had to be escorted by security staff to pick up the equipment so that the Department will not assume the equipment has been stolen.

   Also, due to the layout of City College, many classrooms have poor access for the wheeling of equipment to and from them. Therefore, satellite lockers are used in various locations to store equipment; the instructor checks out the key from the AV Department. Off-campus teachers pick up and transport on their own.

6. Equipment Maintenance: The Media Production Technician performs all preventative maintenance and general repair on AV Department equipment. If he/she cannot repair the equipment, it is sent out to a private vendor. Many of the instructors bring their department's personal equipment in for repair also. The delay time in sending equipment out to be repaired can sometimes be extensive. Many of the department-owned AV equipment do not receive regular maintenance since they are always locked up.

7. Equipment Inventory: Approximately 30% of all AV-type equipment located at City College belongs to the AV Department. Approximately 20% of all AV equipment at City College has been purchased with grant money. As mentioned, the computerized inventory printout of 5/79 is totally erroneous.

CITY COLLEGE (continued)

7. (continued)

Types of equipment include:

Audio Cassette Duplicators

16mm Projectors

S 8mm Projectors

Overhead Projectors

Opaque Projectors

Filmstrip Projectors

35mm Slide Projectors

Audio Tape Recorders/Players

Dissolve Controls

Record Players

P.A. Systems

Porta-Paks

MESA COLLEGE: Overview based on survey findings:

1. Square footage: approximately 2,227
2. Staffing:

1 - AV Librarian

1 - AV Clerk I

1 - AV Clerk II

2 - Media Production Technicians

2 - Hourly CAI's

4 - Work-Study Students

3. Location: Main floor of library.
4. Purchasing Process: Departments can and do purchase their own equipment; however, when the item is delivered to the campus it goes through the AV Department and an inventory card is filed on the item. However, these cards are unable to be updated unless a department brings the equipment in to be repaired.

MESA COLLEGE (continued)

4. (continued)

   - Equipment is also purchased via grant money;
   - The AV Department makes its own purchases;
   - Departmental purchase orders are not screened to determine if equipment is necessary or if it is the right type or most feasible quality of brand for the needed purpose.

5. Delivery/Check-Out System: The AV Department delivers equipment to Day program classes only. They will thread the film and prepare it for instructors to pick up. There are no satellite lockers. Off-campus instructors pick up equipment and transport it themselves.
6. Equipment Maintenance: As per City College's system.
7. Equipment Inventory: Approximately 40% of all AV-type equipment located at Mesa is controlled by the AV Department. The 5/79 computerized inventory is inaccurate. The AV Department maintains a file on all incoming equipment, but they do not know how up-to-date it is. There is no active file on lost or stolen equipment. It was determined via a recent card inventory that much of the AV equipment cannot be located on campus. Many departments hide their equipment so that an accurate count cannot be determined.

ECC: Overview based on survey findings:

1. Square footage: Approximately 300.
2. Staffing:

   1 - Media Production Technician

   2 - Clerical Assistants I - Hourly

3. Location: Second floor of main building.
4. Purchasing Process: All departmental requests for new AV items are submitted through the AV Department; however, the AV Department has little power to deny requests which it feels are unnecessary. The AV Department is able to help requestors make more "knowledgeable" purchases of better quality equipment. The AV Department also submits its own requests for purchases.

ECC (continued)

5. Delivery/Check-Out System: AV equipment that is reserved is picked up and returned by the instructor. The AV Department will also thread the film and prepare the machine prior to the instructor picking up the equipment. Off-campus instructors cannot use ECC AV Department equipment. They either go to City College or are able to use the equipment located at the site where they teach.
6. Equipment Maintenance: As per City College's.
7. Equipment Inventory: 100% of AV-type equipment at ECC is stored in the AV Department. The 5/79 computerized inventory of this equipment is inaccurate. The AV Department maintains a card file on all ECC AV equipment.

MIRAMAR COLLEGE: Overview based on survey findings:

1. Square footage: Approximately 500.
2. Staffing:
   - 1 - Librarian (workload split between AV duties, library and learning center)
   - 1 - AV Clerk I
   - 3 - Librarians (hourly) - (workload split between AV duties, library and learning center)
   - 1 - CAI (CETA) (workload split between AV duties, library and learning center)
   - 4 - Work-Study students (workload split between AV duties, library and learning center).
3. Location: Library
4. Purchasing Process: All Miramar campus AV purchase requests are made through the AV Department for screening and strict control (a recently implemented policy).

MIRAMAR COLLEGE (continued)

5. Distribution of Equipment: Work-Study students deliver and set up the expensive TV porta-pak equipment, but the instructor must reserve three (3) days in advance. Regular AV items must be picked up and set up (signed check-out) by the instructors unless they are unable to set up themselves. Off-campus classes at other public schools utilize that particular school's equipment. Other off-campus instructors do not use Miramar's equipment as it is not allowed off-campus.
6. Equipment Maintenance: As per City College's.
7. Equipment Inventory: 100% of AV-type equipment is stored in, and controlled by, the AV Department. The 3/79 computerized inventory is inaccurate. There is, however, an up-to-date inventory card file maintained by the AV Department.

TABLE VII: ADULT EDUCATION AUDIO VISUAL CHECK-OUT SYSTEM BY ADULT SITES

SITE	LOG	INSTRUCTOR SUBMITS REQUEST	INSTRUCTOR P/U & DEL.	CUSTODIAN P/U & DEL.	RESERVE SYSTEM	BORROW FROM S.U.D.	MAINTENANCE SENT TO ADULT HDQTRS. & SENT TO VENDOR IF REPAIRS TOO DIFFICULT	PURCHASES EACH SITE MAKES LIST OF REQUESTS BASED ON DEPT. NEEDS
NORTH CITY	X	X	X				X	X
NORTH SHORES	X	X		X	X	X Occa-sionally	X	X
KEARNY	X	X	X				X	X
MIDWAY	X	X	X			X(1)	Equipment kept in Custodian's office.	X
CENTRE CITY	X	X		X	X		X	X
SKILLS CENTER	Very little equipment and it is kept in classrooms.						X	X
HARBOR VIEW	X	X	X		X		X	X
NAVAJO		Verbal Request	X		X		X	X
MIRA MESA		Verbal Request	X			X(2)	X	X
EAST SAN DIEGO	X	X		X	X		X	X

(1) Checked through library, teachers give custodian request & he delivers and picks up.

(2) Checked through media center, custodian delivers and picks up.

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